SWITCHING SYSTEMS

FOR
AUTOMATIC TEST, DATA ACQUISITION, COMMUNICATIONS AND CONTROLS

AUTOMATED TEST AND DATA ACQUISITION

COMMUNICATIONS

COMPUTER CONTROLLED

MULTIPLEXERS

MATRIX

DISCRETE RELAYS

HIGH VOLTAGE OR CURRENT

GPIB, IEEE488, RS232, RS422, ETHERNET, LAN, UNIVERSAL SERIAL BUS, PARALLEL TTL

MICROWAVE AND RF

NETWORK AND INTERNET

FIBER OPTICS

VIDEO

VXI, VME, COMPACT PCI BUS SWITCH MODULES

PLUG-IN PC MODULES

FOR TECHNICAL ASSISTANCE CONTACT 1-800-346-3117
www.cytec-ate.com or sales@cytec-ate.com

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   FAX (585) 381-0475

NEW PRODUCT NEWS

CYTEC Corp., supplier of the most comprehensive range of Programmable Switching Systems, continues to expand its product line by offering the following New Products for automated test, data acquisition or communications:

Low Leakage Module

### CXR/2(4x1)-LL-BNC or -Triax for low current or high resistance measurements
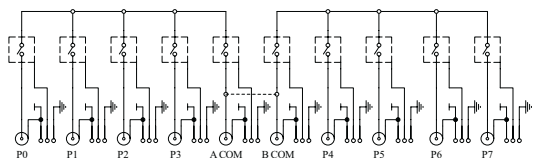
Dual 4x1 low leakage modules can be used to measure currents down to femtoamps (10E-15 amps), or resistances up to teraohms (10E+12). Modules have jumpering options to allow outer conductor isolated or use as a driven guard. BNC or Triax connectors. Fits in Cytec CXAR Series 16, 32, or 128 channel driver chassis. Module can be wired to form 1x8 or 4x2 configurations. Bus bars available to form larger matrices. Call or e-mail for details about your specific needs.

Microwave systems now go up to 40 GHz

Cytec can now build our CXM Series of microwave switching systems using relays with a frequency range of DC to 40 GHz.
Call for Price and availability. **Custom Microwave and RF systems built to your requirements.**
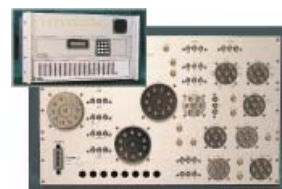
Low Cost Blocking, Nx4 DC to 1 GHz RF or Video Matrix

New CXL/8x4 Switch Module allows for low cost configuration of 8x4, 16x4 or 32x4 matrices with bandpass of 1 GHz in 8x4 (-3dB) and up to 650 MHz (-3 dB) for 50 ohm 32x4 systems. Blocking architecture means that you can connect any input to any output but previously connected paths may need to be interrupted momentarily while the switch is reconfigured. If you can tolerate this interruption that only occurs during configuration this switch can save you as much as 50% off the price of non-blocking systems with similar specs and take up half the rack space. Call 1-800-346-3117 for configuration specific pricing.

Price Lowered on Solid State Analog and Digital Matrices!!!
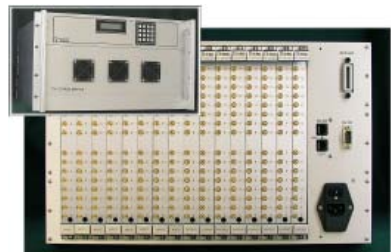
Cytec has lowered the prices on our large solid state digital and analog matrices by as much as 50%. Prices have been lowered on:
TX Series of modular analog matrices -- DC to 140 MHz (small signal 50 and 75 ohm) up to 256x256 configuration.
DX/64x64 high speed differential signal matrices -- RS422, ECL, PECL, LVDS, and CML up to 1.3 Gbps.
DX/256x256 TTL and RS422 matrices -- signals up to 40 Mbps. Check the web for our latest prices! Fill out a catalog request form to receive the price list in PDF.
www.cytec-ate.com

MOST Bus / Toslink Fiber Optic FX/1x8-TL Switch Modules

This opto-electrical-opto module switches Transmit and Receive pairs in an 8x1 or 1x8 configuration. Module can be configured for a variety of applications such as audio, MOST bus, or serial data communications. Modules can be used in FO Series 16, 32 or 128 channel driver chassis. Call or e-mail for application assistance, pricing and availability.

CONTACT 1-800-346-3117, SALES@CYTEC-ATE.COM OR WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE AND A COMPLETE CATALOG WITH PRICING!

New JX Series High Current Switch Module handles up to 30 Amps!

The new JX8/KP-A and JX8/KP-C Switch Modules handle up to 30 amps of AC at 280 Volts or 20 amps of DC at 28 Volts. Rated to 100,000 operations at full load. This module fits into any existing JX system but does require two open slots per module. Call or e-mail for price and availability.

HXC Series High Current Switching Systems handle up to 150 Amps!

Cytec is proud to introduce a complete line of High Current Systems. These systems are capable of switching or breaking up to 150 amps AC or DC and may be wired into almost any desired configuration. Relays available for 40 amps, 60 amps or 150 amp applications. Chassis available to drive from 16 to 128 relays. Call or e-mail for configuration assistance, pricing and availability.

Specs:

|			
Max Switched Current	40 A	60 A	150 A
Max Switched Voltage	277 VAC, 30 VDC	277 VAC, 400 VDC	277 VAC, 400 VDC
Short term carry current	60 amps, 10 mins.	120 Amps, 15 mins.	300 Amps, 10 mins.
Breakdown voltage	2000 Volts peak	2500 Volts peak	2,500 Volts peak
Mechanical life (operations)	10,000,000	200,000	100,000
Electrical life at max load	100,000	3,000	3,000
Switch time	20 ms	50 ms	50 ms

Network Test Access Switches and Power Over Ethernet Test Switches

RJV and RJG Series of Ethernet Test Access Switches

Allows test access to network segments from your desktop, your home, or across the planet and reduces the number of analyzers needed. Both systems use mechanical relays allowing Power Over Ethernet to be switched.

The RJV Series is cost effective for 10 and 100BaseT systems switching 2 pairs on CAT5 RJ45 connectors. Modules available as four 1x2's in latching or non-latching, 12x1 multiplexers or 6x4 matrices. Up to 12 modules per chassis. Many configurations possible.

The RJG Series of Ethernet Switches is designed to handle copper 1000BaseT Gigabit Ethernet signals. They switch all 8 wires of Cat5 or Cat6 wiring in 1x12 increments for multiplexers or 6x3 matrix increments.
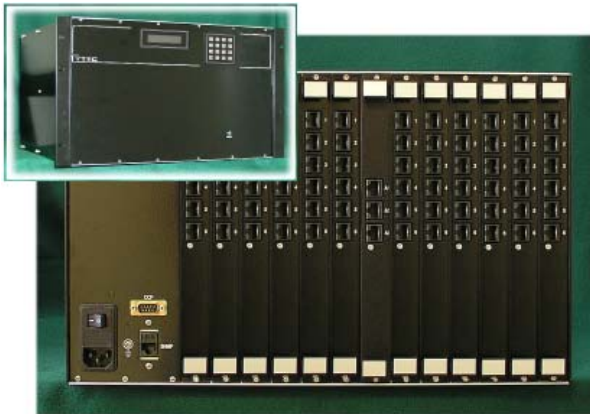
Failsafe and redundancy switches

Cytec's Failsafe Switch Systems may be used to provide Network Protection, redundant system switch over for Data Communications or Power, and even a means to switch to your equipment's backup system when needed. Our passive systems act like a piece of cable so they can replace messy patch panels, and they permit reconfiguration of systems without ever leaving your desk.

Systems Available for:

Copper Ethernet -- Coax, 10 Base-T, 100 Base-TX, 1000 Base-T.
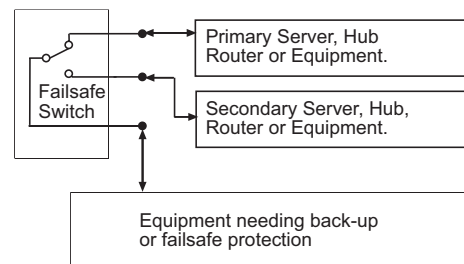**Fiber** -- Multimode or Singlemode.
WAN and Telco -- POTS to T3 copper, OC1 to OC12 Fiber, DSL.
Coaxial and Cable -- DC to 40 GHz, Microwave or Cell.
Serial Data -- RS232, 422, 485, 530, ECL, LVDS, USB, Infiniband.
Video -- Virtually any and all types.
Power -- DC or AC, up to 5000 Volts and 150 amps.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Material or Workmanship for a period of 5 years and that all switches are guaranteed for their rated operations.

CONTACT 1-800-346-3117, SALES@CYTEC-ATE.COM OR WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE AND A COMPLETE CATALOG WITH PRICING!

NEW PRODUCT NEWS

CYTEC Corp., supplier of the most comprehensive range of Switching Systems, continues to expand its product line by offering the following New Products:
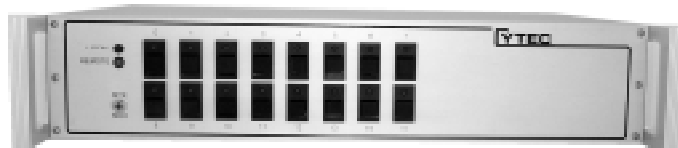
NEW FIBER OPTIC SYSTEMS

FO SERIES OF PASSIVE FIBER SWITCHING SYSTEMS

CYTEC's New FO Series of Fiber Optic Switches use electro mechanical optical relays to form 1xN multiplexers or NxM matrices. These 19" rack mount or bench top systems are available in a variety of configurations.

FO/16 Mainframe front panel with MC/16 Pushbutton manual control

SYSTEM FEATURES:

- **Computer control via GPIB, RS232, or 10BaseT Ethernet.**
- **Optional Manual control.**
- **LED front panel indication of latched switch points.**
- **Bidirectional, all wave lengths and baude rates switched.**
- **Systems from 1 to 1000 switch points.**
- **Remote Status Feedback of switch position.**

- **Single mode or multimode.**
- **Many connector options including FC, SC, and ST.**
- **Insertion Loss as low as .3 dB.**
- **Discrete switches, group switches or failsafe switches**
- **Custom systems available.**
- **Software support for most programming platforms.**
- **Five year warranty.**

Mainframe systems available as 16 through 128 switch points in 3.5" tall to 10.5" tall chassis. Larger systems can be assembled using a Mesa Controller and multiple expansion chassis.   Call CYTEC with your configuration.

Pricing starts as low as $1,500.00
Availability: 30 to 45 days ARO.

NEW 4800 SERIES 64X64 DIGITAL SIGNAL SWITCH MATRIX

The 4800 series Digital 64X64 Matrix switches single ended or differential signals up to 2.0 GBPS. Available for ECL, PECL, LVPECL, LVDS, CML, HDTV or many other digital signal types. Input and output transition boards furnish level translations or signal type conversion and connector options.

4800/64x64 Differential ECL/PECL Matrix

SYSTEM FEATURES:

- **Available in incremental sizes from 16x16 to 64x64.**
- **Matched path lengths for low skew.**
- **Rise and Fall times as fast as 150 ps (20% to 80%).**
- **Completely non blocking (any input to any output).**
- **Full fan-out (any input to several or all outputs).**
- **Available as dual differential Clock and Data Matrices.**
- **Jitter correction feature actually improves poor signals.**
- **Multiple connector options.**
- **Computer control via GPIB, RS232, or 10BaseT Ethernet.**
- **Front panel manual control with LCD display.**
- **Remote Status Feedback of switch position.**
- **Full five year warranty.**

This system incorporates an advanced solid state switch fabric that can actually help restore signal levels, correct deterministic jitter and clean up rise time problems associated with wiring and cable runs. Transition boards are also available separately for performing signal conversions in applications which do not require switching. Call CYTEC's Technical Sales Department to discuss your application.

Prices starting at $20,000.00
Availability: 60 days ARO.

CONTACT 1-800-346-3117, SALES@CYTEC-ATE.COM OR WWW.CYTEC-ATE.COM
FOR TECHNICAL ASSISTANCE AND A COMPLETE CATALOG WITH PRICING!

NEW JX32/L2 SWITCH MODULE

This module has 32 two pole relays as shown in the figure below with signal inputs wired to two 34 pin header connectors. The two 16x1 muxes can be jumpered together to form one 32x1 mux. The outputs are available on a 10 pin header connector or can be jumpered to the card edge connector which plugs into the backplane. It is available with **Type A** relays only. The relay specs are listed at the bottom of this page.

This module fits into all standard JX mainframes or Expansion chassis. By using 16 of these modules, a single JX mainframe can be configured as a 512x1 two pole multiplexer or a 1016x1 single pole multiplexer.
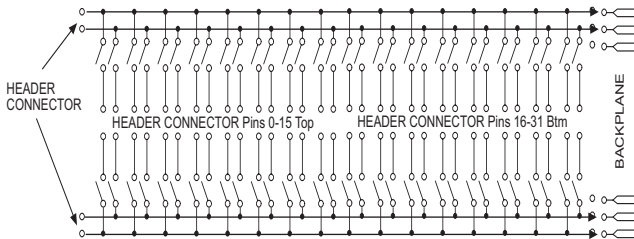

Price: $420.00
Availability: 1 week ARO

NEW CPCI/64x1 TWO POLE MATRIX

This Compact PCI / PXI switch module has 8 independent 2 pole, 8x1 multiplexers. Each 8x1 segment may be jumpered to another or used individually to provide a large variety of configurations. All signals are brought out to a high density 160 pin connector. The module uses **Type A** relays only. The relay specs are listed on the bottom of this page.
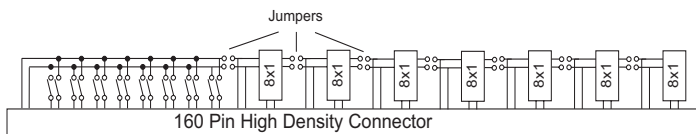
Price: $750.00
Availability: 2 weeks ARO

TYPE A RELAY SPECIFICATIONS:

|	
Contact Rating:	30 Watts, 62.5 VA
Max. Switching Voltage:	110 VDC, 125 VAC
Switching Current:	1.0 A
Carrying Current:	2.0 A
Breakdown Voltage:	750 V
Operate Time:	3 ms

NEW VME/16X16 RF MATRIX

CYTEC's VME/16x16 Video and RF Matrix module uses a solid state switch fabric and is a nonblocking, full fan-out 16x16 matrix with bandpass to 180 MHz. This 6U VME or B sized VXI module may be used for 50 or 75 ohm signals and comes with SMB connectors.

Typical applications include:
50 ohm RF communication signals.
75 ohm Video.
75 ohm DS3.
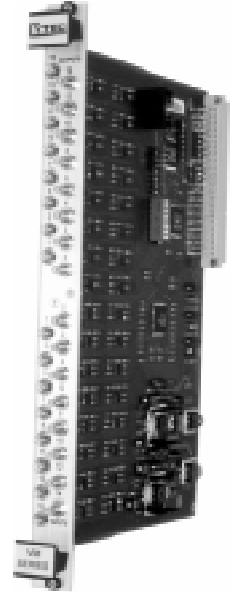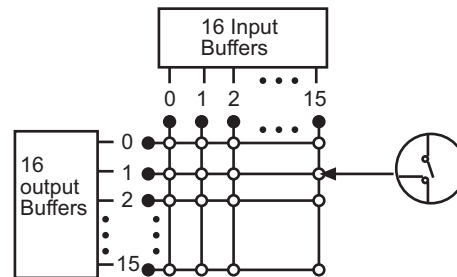
SPECIFICATIONS:

Bandpass:	
75 ohms, 0.2 Vpp:	>180 MHz, -3 dB
75 ohms, 2.0 Vpp:	>100 MHz, -3 dB
50 ohms, 0.2 Vpp:	>225 MHz, -3 dB
50 ohms, 4.0 Vpp:	>165 MHz, -3 dB
50 ohm peak gain:	+6 dB @ 150 MHz
Flatness:	1 dB to 40 MHz
Crosstalk:	All hostile = <-55dB @ 10MHz
Isolation:	Input to Output = <-60dB @ 10MHz

GENERAL SPECIFICATIONS:

VXI Revision:	1.4.
Module Size:	VME 6U or VXI B size.
Logical Address:	per DIP Switch setting.
Communication:	Register Based.
Bus/Address Type:	D16/A16/D08(O).
Write Cycle:	less than 500 nsec.
Read Cycle:	less than 500 nsec.

Software support includes programming examples in C and drivers for National Instruments LabView or LabWindows programming platforms. Demonstration modules are available on request

Price: $3,500.00 each.
Available 2 weeks ARO.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Material or Workmanship for a period of 5 years and that all switches are guaranteed for their rated operations.

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740 FAX (585) 381-0475

NEW PRODUCT NEWS

CYTEC Corp., Manufacturer of the most comprehensive range of Switching Systems, continues to expand its product line and is now offering the following New Products:

NEW TX SERIES 128X128 COAXIAL 50 or 75 OHM SWITCH MATRIX

The TX/128x128 Series furnishes both nonblocking and full fan-out solid state switching of 50 or 75 ohm coaxial signals up to 140 MHz. Suitable for RF, Radar, Video, DS3 or other single ended coaxial signals. This system will also soon be available as a 256x256 blocking configuration.

SYSTEM FEATURES:

- **Modular System available in sizes from 16x16 to 128x128.**
- **Small signal bandpass of 140 MHz (0.2 Vpp).**
- **Large signal bandpass of 50 MHz (8 Vpp).**
- **Completely nonblocking (any input to any output).**
- **Full fan-out (any input to several or all outputs).**
- **Amplifier modules available for buffering or level conversion.**
- **Isolation of -60 dB at 40 MHz for non adjacent inputs.**
- **Isolation of -48 dB at 10 MHz for all hostile.**
- **Patch panels allows for multiple connector options.**
- **Computer control via GPIB, RS232, or Ethernet.**
- **Optional front panel Manual Control with LCD display.**
- **Remote Status feedback of switched positions.**
- **Full five year warranty.**
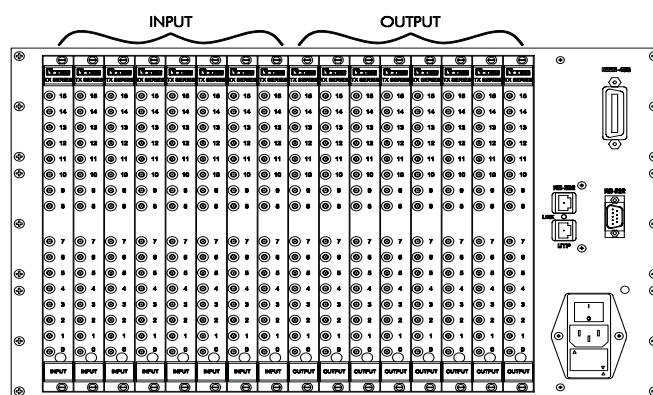
TX/128x128 Matrix Rear Panel

TX Series Solid State Coaxial Matrix

CYTEC's TX/128x128 Coaxial Matrix is a modular system with up to 128 inputs and 128 outputs in a nonblocking, full fan-out configuration. The system accepts up to eight input modules and eight output modules with 16 connections per module. Each module can be configured with or without amplifiers for 50 or 75 ohm signals up to +/- 4 volts. System may be purchased originally as a 16x16 and expanded at any time by simply adding more modules.
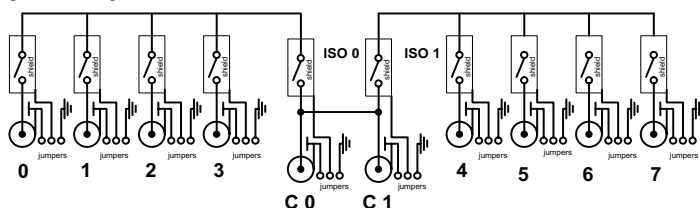
Telephone for Pricing.   Availability: 60 days ARO

CXR/8x1-LL LOW LEAKAGE MODULE

This new switch module fits into the CXAR Series Chassis and provides signal isolations on the order of 10^15 Ohms. Applications include high insulation resistance measurements, low current switching down to femtoamps and high speed capacitance measurements.

MODULE FEATURES:

- **Faraday Shielded Signals eliminate relay drive leakage.**
- **Shielded Low Leakage Relays minimizes relay drive coupling.**
- **Output Isolation Relays minimize leakage "addition".**
- **Dual Commons allow multiple modules to be interconnected.**
- **Available Connectors include BNCs, Twin Ax and Triax.**
- **Jumper positions provide for Grounded Guard, Isolated Guard or Driven Guards.**
- **Suited to very high IR, low current to femtoamps and high speed capacitance measurements.**

Pricing: **$450.00 with Triax Connectors**
                                     $380.00 with BNCs.
Availability: 30 days ARO

CONTACT 1-800-346-3117 SALES@CYTEC-ATE.COM OR WWW.CYTEC-ATE.COM
FOR TECHNICAL ASSISTANCE AND A COMPLETE CATALOG WITH PRICING!

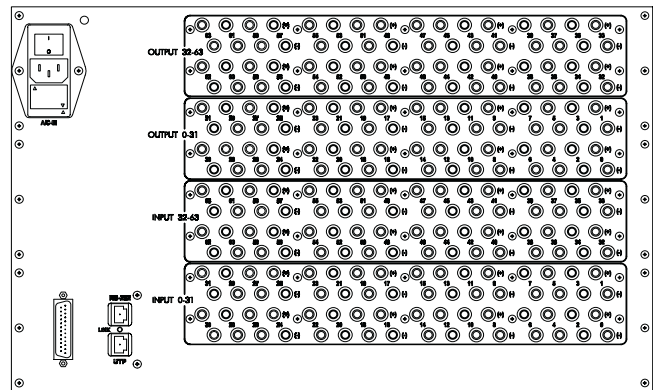# DX SERIES 64x64 HIGH SPEED DIGITAL SIGNAL SWITCH MATRIX

The DX Series Digital 64x64 Matrix switches single-ended or differential signals up to 2.0 Gbps. Available for ECL, PECL, LVPECL, LVDS, CML, HDTV or many other digital signal types. Input and output transition boards supply level translations, signal conversion or alternate connector options.

SYSTEM FEATURES:

• Available in incremental matrix sizes from 16x16 to 64x64.
• Matched path lengths for low skew.
• Rise and Fall times as fast as 150 psec (20% to 80%).
• Completely nonblocking (any input to any output).
• Full fan-out (any input to several or all outputs).
• Available as dual differential Clock and Data Matrices.
• Jitter correction feature actually improves poor signals.
• Multiple connector options.
• Computer control via GPIB, RS232 or Ethernet.
• Optional front panel Manual Control with LCD display.
• Remote Status Feedback of all switch positions.
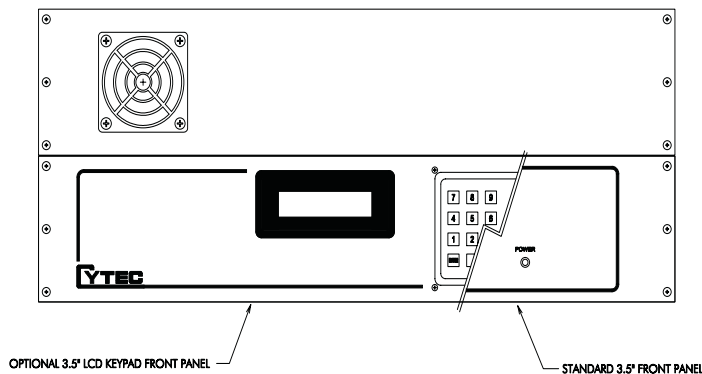• Full five year warranty.

Prices starting at $20,000.00
Availability: 60 days ARO.

DX Series 64x64 Differential ECL/PECL Matrix Rear

This system incorporates an advanced solid state switch fabric that helps restore signal levels, corrects deterministic jitter and cleans up rise time problems associated with wiring and cable runs.   Input and Output Transition Modules are also separately available that perform signal conversions in applications which do not require switching. Call CYTEC's Sales Department to discuss your application.

NEW SOLID STATE DX SERIES 256x256 DIGITAL SWITCH MATRIX

OPTIONAL 3.5" LCD KEYPAD FRONT PANEL
(REPLACES STANDARD PANEL)

STANDARD 3.5" FRONT PANEL

DX/256x256 Solid State Switch Matrix

• Applications include TTL, CMOS, RS232 and RS422 data.

SYSTEM FEATURES:

• Available in incremental sizes from 64x64 to 256x256.
• Completely nonblocking (any input to any output).
• Full fan-out (any input to several or all outputs).
• Available as dual differential Clock and Data Matrices.
• Multiple connector options.
• Computer control via GPIB, RS232, or Ethernet.
• Optional front panel Manual Control with LCD display.
• Remote Status Feedback of all switch positions.
• Full five year warranty.

The Solid State DX/256x256 Solid State Series is a very high density, low cost switch matrix that is designed to switch digital TTL or CMOS signals up to 40 Mbps (80 Mbps NRZ). Input and Output Transition Modules can be provided for differential signals or level conversion allowing for signal types such as RS232, RS422 or almost any digital data stream. Optional Patch or Breakout Panels furnish almost any connector type specified by the end user. The Matrix may be configured for multiwire switching, such as a Dual Clock and Data Matrix or Rx and Tx signals.

Prices starting at $20,000.00
Availability: 60 days ARO.

SOFTWARE

Free Example/Driver programs are available for most modern Operating systems. Platforms include: C, Visual Basic, Java, LabView and LabWindows.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Material or Workmanship for a period of 5 years and that all switches are guaranteed for their rated operations.

CONTACT 1-800-346-3117, SALES@CYTEC-ATE.COM OR WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE AND A COMPLETE CATALOG WITH PRICING!

YTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   FAX (585) 381-0475

MESA SERIES
MATRIX EXPANSION SYSTEMS

The MESA Series Controllers make it possible to control multiple CYTEC switch chassis from one Control Module. It can be utilized to build large Matrix or Multiplexer configurations or simply run multiple different types of chassis. The MESA also saves money on large systems since each chassis does not need a separate control module and often do not need power supplies.

These Chassis can be any combination of different types of Expansion Chassis from CYTEC's complete line of switching products.

MESA Expansion System

MATRICES   **MULTIPLEXERS**   **COAXIAL**

IEEE 488 BUS

RS232 SERIAL

PC I/O PORT

LAN
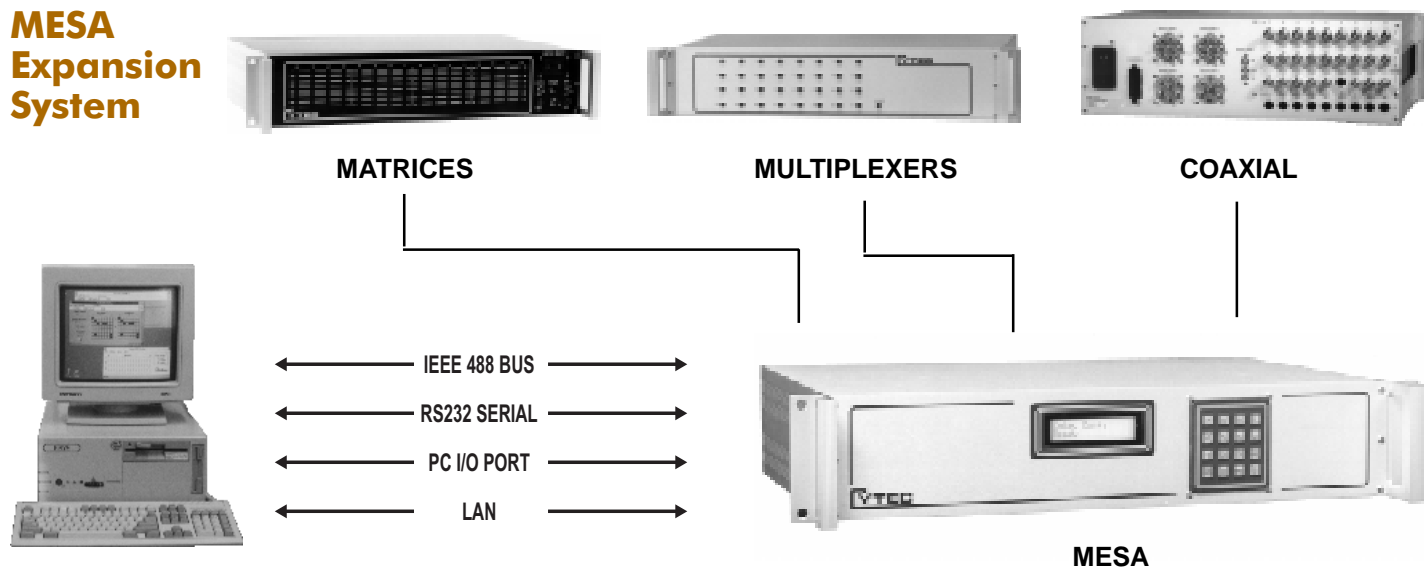
MESA

MESA CONTROL UNITS

There are three basic Control Units: the MESA 4, the MESA 16 and the MESA 32.

MESA 4 CONTROL UNIT

This Control Unit has 4 Output Ports to control 4 Expansion Chassis from one Control Module. The MESA 4 is 3.5" high.

MESA 16 CONTROL UNIT

This Control Unit has 16 Output Ports to control 16 Expansion Chassis from one Control Module. The MESA 16 is 3.5" high.

MESA 32 CONTROL UNIT

This Control Unit has 32 Output Ports to control 32 Expansion Chassis from one Control Module. The MESA 32 is 7" high.

MANUAL CONTROL OPTIONS

MC-2 has keypad selection of the switches with display.

VMCS is a software interface which enables the remote operator to view the Status of the Matrix and to Control Switch Selection using a full Graphical User Interface.

CONTROL MODULES

The following Control Modules are available:

CM-1 TTL CONTROL

This module utilizes TTL / CMOS signals and requires 13 input bits and 1 output bit. Typically used when high speed communication is necessary. May be driven from a CYTEC PC-IO computer card.

CM-5 IEEE488/RS232

This Module has both the IEEE488 Bus and RS232 Serial Control . See page **MESA-3** for details.

IF-6 LAN INTERFACE

This module interfaces between the Local Area Network and the RS232 Control Modules using TCP/IP commands.

Drivers available for National Instrument's LabView or LabWindows programming platforms or Agilent VEE programming platform.

MESA CONTROL UNITS

There are three basic models of the MESA Control Unit: the MESA 4, the MESA 16 and the MESA 32. They contain Power Supplies and an Expansion Motherboard. The Control Module and Expansion Interface Modules plug into the Motherboard so that one Control Module can control up to 32 Expansion Chassis.

The System shown in Fig. 1 has a MESA 16 Control Unit and four Expansion Chassis arranged and addressed as a 32x16 Matrix. This leaves 12 additional ports to expand the system by adding twelve Expansion Chassis.

MESA 4 CONTROL UNIT

This is a 19" rack mountable chassis, 3.5" high and 12" deep which will accept any of the Control Interfaces and 4 Expansion Ports to control 4 Expansion Chassis. The Power Supply has sufficient logic power to drive all 4 Expansion Chassis and relay power to energize up to 200 relays at one time.

MESA 16 CONTROL UNIT

This is a 19" rack mountable chassis, 3.5" high and 12" deep which will accept any of the Control Interfaces and 16 Expansion Ports to control up to 16 Expansion Chassis as shown in **Fig. 1**. The Power Supply has sufficient logic power to drive all 16 Expansion Chassis and relay power to energize up to 200 relays at one time.

MESA 32 CONTROL UNIT

This is a 19" rack mountable chassis, 7" high and 15" deep which will accept any of the Control Interfaces and 32 Expansion Ports to control up to 32 Expansion Chassis. The Power Supply has sufficient logic power to drive all 32 Expansion Chassis and relay power to energize up to 200 relays at one time.
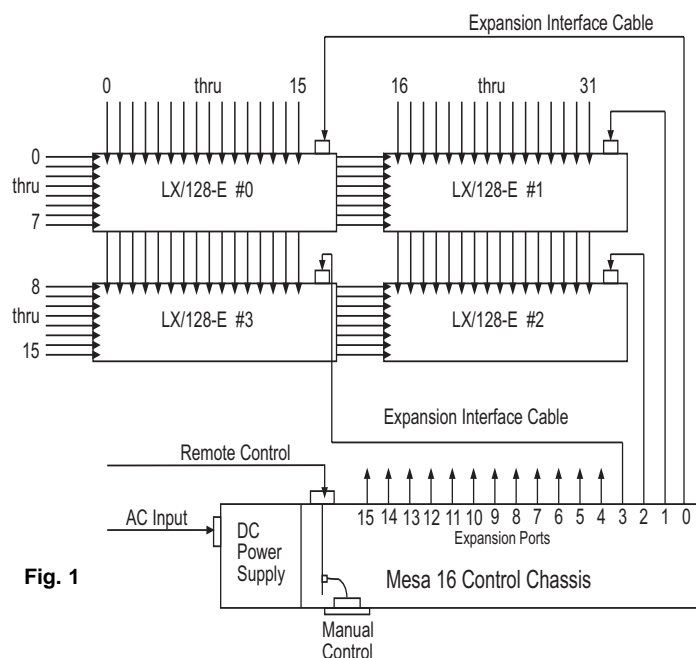

Fig. 1

MESA TO EXPANSION CHASSIS DISTANCE

Individual Expansion Chassis are normally supplied with 6 foot cables. The expansion chassis can be provided with ribbon cables up to a length of 20 feet on request. Expansion chassis may be located up to 200 feet from the MESA if a better type of cable is used. To discuss these options please contact CYTEC's sales staff.

RELAY POWER REQUIREMENTS

The 12 volt relay power supplied with the MESA Control Units is sufficient for most Matrix or Multiplex operations. However, some applications require a larger number of switches to be closed. For these cases, two options are offered: Auxiliary Power Supply or Powered Expansion Chassis.

AUX-1 POWER SUPPLY

This is a separate 19" rack mounting chassis, 3.5" high and 12" deep with +5 volt logic power for up to 32 Expansion Chassis and relay power to energize up to 500 relays.

POWERED EXPANSION CHASSIS

Where the power requirement in individual Expansion Chassis is very high, each Expansion Chassis can be supplied with its own relay power supply capable of energizing up to 200 relays per Expansion Chassis.

CONTROL MODULES

The Control Modules are plug compatible with all the MESA control Units and have the same command structures for Control and Switch Selections.

The commands for Mode Control are Latch, Unlatch, Matrix Mode, Mux Mode, Clear or Status Request.

The standard commands for selecting a Switchpoint are to select Matrix, Module and Switch.

These modules are available to control the MESA Units from TTL, IEEE488 BUS, RS232 Serial Port or 10Base-T Ethernet LAN.

They include standard or special firmware for different configurations such as:

In a Matrix configuration, the command can be Input # and Output # selection for the crosspoint.

In a Multiplexer application, the command can be Channel # selection for one switch selection only.

CM-5 IEEE488/RS232

This Module combines both the IEEE488 Talk Listen Control and the RS232 Serial Controls.

IEEE488 TALK/LISTEN (GPIB)

The Talk and Listen addresses are the same and are set by a 5 position DIP Switch. In the Listen Mode, the Matrix responds to specific commands. The Talk Mode is used to return the Status of the Matrix.

Command Summary

M - Matrix - Select a specified Matrix.

L - Latch - a specified Module and Switch in a Matrix.

U - Unlatch - a specified Module and Switch in a Matrix.

X - Multiplex - Latches a specified Switch and Clears all others.

C - Clear - Unlatches every switch in the Matrix.

S - Status - The Status of the Matrix is returned to the Controller.

F - Front Panel - Allows the disabling of front panel controls.

P - Program - Allows the operator to set up Matrix variables such as size and configuration and stores them in nonvolatile memory.

Typical Commands Are:

Command	Function
L, n1, n2, n3	Latch Selected Switch
U, n1, n2, n3	Unlatched Selected Switch
X, n1, n2, n3	Mux Selected Switch
	n1=Matrix, n2=Module, n3=Switch
C	Clear entire system
C, n1	Clear matrix - n1=Matrix
S	Status of Entire System
S, n1	Status of Matrix - n1=Matrix
S, n1, n2, n3	Return Switch Status
	n1=Matrix, n2=Module, n3=Switch
F, n1, n2,	Front Panel Lock out
	n1=0 disable, n1=1 enable, n2=access
P, n1, n2, n3	Program setup
	n1=Parameter, n2=value, n3=access

RS232 SERIAL

The module can be configured as either a Data Terminal Equipment (DTE) or Data Communications Equipment (DCE). The Baud Rate is software programmable from 110 to 19,200 Baud and is stored in nonvolatile memory.

The Command structure is the same as the IEEE488 Module and has the following additional command features:

E - Echo - Echoes all received characters back to the source.

V - Verbose - Enables the matrix to return text strings in response to Commands, including error statements.

H - Help - This is a summary of all the Commands.

RS232 Specific Commands

Command	Function
B, n1, n2	Baud Rate - n1=rate, n2=access
E, n1, n2	Echo - n1=0 off, n1=1 on, n2=access
V, n1, n2	Verbose - n1=0 off, n1=1 on, n2=access

CM-6 LAN INTERFACE

This is a 10Base-T Ethernet LAN to RS232 interface module which accepts data in TCP/IP format from the Local Area Network and outputs it in RS232 format to the MESA.

When used with the RS232 Serial Module, it can control the MESA Control Units with the same Command Structure detailed in the CM-5.

This interface can be used to access the MESA Control Unit from remote locations and from several users via the Local Area Network using raw TCP/IP, or Telnet. Setup of the interface is through an external RS232 connection which allows you to specify TCP/IP address, host name, gateways and many other network parameters.

The LAN interface manual is available via e-mail in PDF format by contacting CYTEC's sales staff.

RAM OPTION

This option is available in the **CM-5** and **CM-6**. Switch selections are stored in the battery backup RAM (Random Access Memory) with the following benefits:

At Power-On, the switches can be latched to a preset default switch configuration.

In cases of momentary power loss, the matrix will be reset to the last selected configuration before loss of power.

Multiple configurations can be stored and recalled as required up to a maximum of 1,000 switch selections.

MANUAL CONTROL OPTIONS

Two types of Manual Control are offered: the MC-2 and the VMCS.

MC-2 KEYBOARD CONTROL

This Manual Control has a keyboard and LCD backlit display mounted on the front panel.

The LCD display has two lines of 16 alphanumeric characters. The top line displays the matrix commands and switch selection.

The bottom line displays the Status of a selected switch and Error messages.

This module can only be used with the **CM-5** and **CM-6** Controls.

VMCS VIRTUAL MANUAL CONTROL SOFTWARE

This enables the remote operator to view the Status of the Matrix using a full Graphical User Interface.

The matrix configuration is displayed and crosspoints are selected by a point and click operation. Each selected crosspoint is prominently shown on the display.

Custom labeling of the Inputs and Outputs can be programmed. One optional mode of operation prevents selection of switches that would interconnect two Inputs or two Outputs.

SOFTWARE

Drivers and/or sample programs are available with the most commonly available application programming languages.

EXPANSION CHASSIS

The versatility of the MESA Expansion System is that it enables up to 32 Expansion Chassis of different types to be controlled from one Control Unit. This means that it is possible to build a complete Switching System requiring Matrices, Multiplexers, Group Switches or Individual Relays by selecting the Expansion Chassis and Switch Modules most suitable for the application.

Each Expansion Chassis can be used for handling different types of signals including: Low Level Instrumentation, High Frequency Coaxial, Audio, Video, High Voltage or High Current. The Expansion Chassis can be remote from the Control Unit so that each chassis can be placed close to the signal source, reducing wiring length with improvement in signal transmission.

The Expansion Chassis summarized below can be used in any combination with the MESA Control Unit. Full details on each type of Chassis are described in respective bulletins which are part of the CYTEC catalog. The photograph shows a typical Switching System used to analyze ultrasonic data from a large number of transducers and to record the data on several tape recorders.

Expansion chassis available in the following product series:

CXAR SERIES MULTIPLEXERS
Coaxial 50 or 75 ohm 1xN multiplexers with bandpass up to 1GHz.

CX SERIES MATRICES
Coaxial 50 or 75 ohm NxM matrices with bandpass up to 700 MHz.

CXM SERIES
Microwave multiplexers and matrices with bandpass up to 18GHz.

VDX SERIES
50 or 75 Ohm solid state, video or RF matrices up to 180 MHz. 16x16 through 128x128 sizes.

LXA SERIES GENERAL PURPOSE
128 relay system has the most versatile selection of Switch Modules, for matrix or multiplexer, low level to high power, frequencies below 20 MHz.

LXB SERIES MATRICES
128 relay matrix configurations for power, low level and signals below 20 MHz.

HXV SERIES
Switching for High Voltage Signals up to 5000 volts.

Expansion chassis available in the following product series:

RS SERIES
Multiplexers (1xN configurations) for multi wire communications such as RS232 and RS422. 9, 15 or 25 wires on D type connectors.

RSM SERIES
Matrix configurations for 9, 15, or 25 wire data signals.

RJV SERIES
4 and 8 wire signals on RJ45 connectors such as 10/100/1000 BaseT.

RJM SERIES
2, 4, 6 or 8 wire signals on RJ45 connectors in matrix configurations.

GX SERIES
Used specifically to switch large numbers of signals as a group.

VX SERIES
General purpose, 256 channel units with a versatile range of modules.

JX SERIES
High density 1xN or 2xN configurations. Up to a 1000x1 mux in a single chassis.

FX SERIES
Fiber Optic optical-electrical-optical (OEO) matrices available in non-blocking, full fan out matrix configurations up to 64x64.

FO SERIES
Passive Fiber Optic switches in a variety of configurations.

PX SERIES
Compact, cost effective matrices. 512 relays in a 3.5" high chassis.

HDX 4600 SERIES
High density matrices. Up to a 64x32 two wire matrix in a single chassis.

DX SERIES
Digital matrices up to 64x64 for LVDS, PECL, ECL, HDTV or other extremely fast digital signals.

All CYTEC Switching Systems have field proven reliability and are backed by a 5 year warranty.

For technical assistance with your switching applications, contact the Switching Specialists at:

1-800-346-3117

or

www.cytec-ate.com

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740 FAX (585) 381-0475

4600 SERIES
VERY HIGH DENSITY SWITCHING MATRICES

CYTEC's new 4600 Series are economical, high density, passive, bidirectional switch matrices. Each chassis holds up to 2048 two pole Type A relays, and a modular design allows great flexibility in creating different switching topologies. For example, the following single chassis configurations are all possible: 64x32 two pole matrix, 32x32 four pole matrix, 32x8 eight pole matrix or 32x8 sixteen pole matrix. Several independent matrices, such as a four separate 32x16 two pole matrices, can be provided in one chassis as well. Please contact CYTEC directly to discuss configuration options. Computerized control is via combined RS232/IEEE488, with 10BaseT Ethernet and Manual Controls optionally available.

4600 CHASSIS
The 4600 chassis are standard 19" rack mounting units and are built as either Mainframe or Expansion Chassis. From 128 to 2048 individual switch points are furnished. Input and output signal connectors are standard IDC Headers and are accessed from the chassis rear.

4600 MAINFRAME
The standard mainframe is built with power supplies, a Control Module and, optionally, a Manual Control. The system is completed by adding as required from one to sixteen of the 4600/8(2x8) Switch Modules shown on this bulletin's second page.

4600-E EXPANSION CHASSIS
The expansion chassis is identical to the mainframe in size and function. The expansion chassis, however, is built without a dedicated control module, manual control or power supplies. Instead, it is designed to be both powered and controlled by one of CYTEC's MESA Control Chassis detailed in the **MESA Bulletin**. Ribbon Expansion Cables connect the expansion chassis to the MESA.

CUSTOM CHASSIS
Custom configurations are available upon request. Most custom systems wire out the rear panel Input/Output connections to a required connector type that is different from the standard headers. This wiring is priced on the basis of labor and materials.

WARRANTY
CYTEC Corp. warrants that all products are free from defects in Material or Workmanship for a period of 5 years and that all switches are guaranteed for their rated operations as shown on the second page.

4600 Series Matrix w/one Switch Module Installed

CONTROL MODULES
IF-5 IEEE488/RS232 CONTROL MODULE
This module provides remote control via both RS232 Serial and IEEE488 Talk/Listen interfaces as detailed in Applications Bulletin AP-5.

IF-6 LAN INTERFACE
This optional module allows control over a 10BaseT Ethernet Local Area Network via TCP/IP protocols as described in Applications Bulletin AP-5.

MANUAL CONTROL
MC-2 WITH LCD DISPLAY
This local control supplies a front panel Keypad and LCD Display that lets the operator control any switch and verify switch status.

VMCS
This Virtual Manual Control Software allows a remote operator using a PC to view matrix Status and control switches using a full Graphical User Interface.

CONTACT 1-800-346-3117 OR WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE
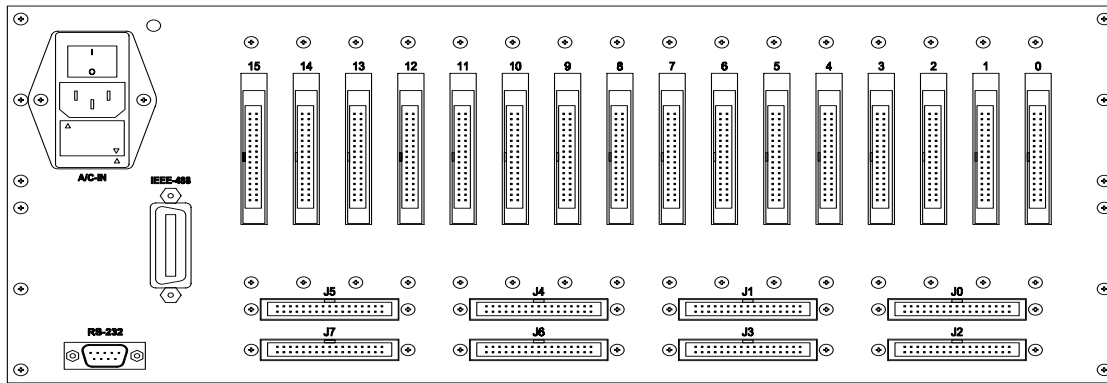
4600 SERIES MAINFRAME

Fig. 1   4600 Mainframe Rear View

STANDARD MATRIX CONFIGURATIONS

One of several different possible matrix configurations can be supplied by jumpering the 4600/8(8x2) Switch Modules and/or the Chassis Motherboard as shown in **Fig. 2**. The matrix is passive and bidirectional, and any input can be routed to any output without interrupting previously connect I/O paths.
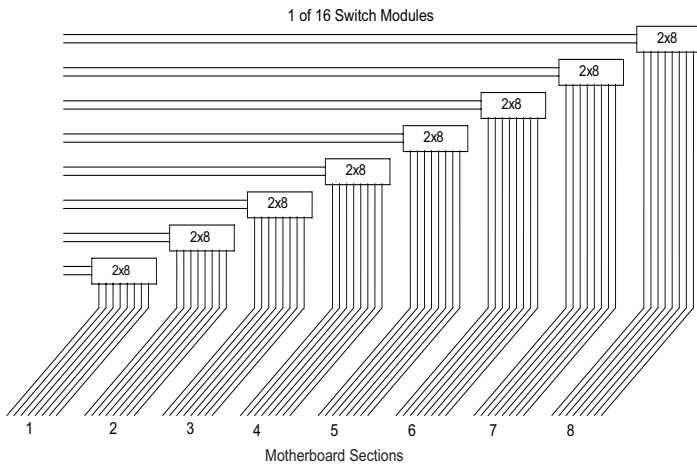

**Fig. 2   Matrix Configuration Options**

Each Switch Module is eight individual (8x1) two pole matrices. The Chassis Motherboard has eight, 8 pair trace sections. Presuming a full chassis holding 16 switch modules, any one the following configurations is possible:

Config.#	Jumpers	Jumpered Sect.	Matrix Size
1	None	None	8(32x8)
2	Motherboard	1,5 -2,6-3,7-4,8	4(64x8)
3	Motherboard	1,3,5,7 - 2,4,6,8	2(128x8)
4	Motherboard	1,2,3,4,5,6,7,8	256x8
5	Module	1,2-3,4-5,6-7,8	4(32x16)
6	Module	1,2,3,4 - 5,6,7,8	2(32x32)
7	Module	1,2,3,4,5,6,7,8	32x64
8	#6 + Drives	1,5-2,6-3,7-4,6	4 wire 32x32
9	#3 + Drives	1,2-3,4-5,6-7,8	4 wire 128x8
10	#2 & 5 + Drives	1,3-2,4-5,7-6,8	4 wire 64x16
11	#2 + Drives	1,2,3,4 - 5,6,7,8	8 wire 64x8
12	#5 + Drives	1,3,5,7 - 2,4,6,8	8 wire 32x16
13	#1 + Drives	1,2,3,4,5,6,7,8	16 wire 32x8

4600 SERIES SWITCH MODULES

Each Switch Module is assembled with a total of 128 two pole **Type A** relays.   The module's basic configuration arranges the relays as eight separate 2x8 two pole matrices. However, individual 2x8's may be interconnected via built-in jumpers to furnish many different configurations as required. For example, jumpering all eight 2x8's creates a 2x64 two pole switch module, and installing the maximum of 16 switch modules into one chassis (with a standard motherboard) results in a 32x64 two pole matrix.

Fig. 3   Switch Module 2x8 Section (1 of 8 shown)
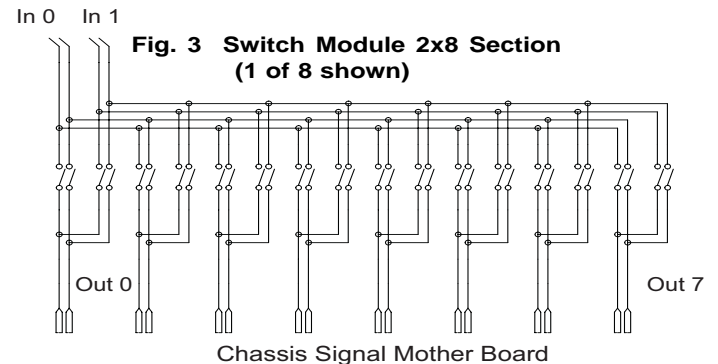
TYPE A RELAY SPECIFICATIONS

Contact Rating	30 VA
Switching Voltage	110 VDC
Switching Current	1.0 A
Carrying Current	1.0 A
Breakdown Voltage	750 VDC
Operate Time MSec	3
Lifetime (mechanical)	100 million cycles

GENERAL SPECIFICATIONS

Dimensions - 19" rack mounting, 7.0" high and 21" deep
Weight - less than 40 lbs. fully loaded with 16 switch modules
AC Mains - 115 VAC or 230 VAC, 47-400 Hz, 100 Watts
Operating Temperature - 0 to 50 deg. C.
Storage Temperatures - -25 to 65 deg. C.
Bandpass (-3 dB) - DC to 20 MHz for 32x64 two pole matrix

YTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   FAX (585) 381-0475

CX SERIES
COAXIAL AND RF
SWITCHING MATRIX

The CX Series of Switching Matrices are available in a variety of single wire coax configurations designed to operate in the range from DC to 700 MHz with many options to minimize price while meeting the desired specifications.

IEEE 488 BUS

RS232 SERIAL

LAN

CXG/8x8 50 ohm Mainframe

CX MAINFRAMES AND EXPANSION CHASSIS

CXB MAINFRAMES -- DC to 50 MHz
Modular Systems with BNC connectors available in incremental nonblocking configurations from 1x8 to 16x8, or from 2x4 to 32x4. 19" rackmount chassis, 3.5" high. See page CX-2 of bulletin for complete specifications.

CXE MAINFRAMES -- DC to 50 MHz
Modular Systems with BNC connectors available in incremental nonblocking configurations from 2x8 to 32x8.   19" rackmount chassis, 3.5" high. See page CX-2 of bulletin for complete specifications.

CXG MAINFRAMES -- DC to 700 MHz
Available as 4x8 or 8x8 nonblocking matrices in 50 or 75 ohm characteristic impedance. Available with BNC, SMA or user specified connectors. 19" rackmount chassis, 7" high. See page CX-3 of bulletin for complete specifications.

CXF MAINFRAMES -- 10 MHz to 500 MHz
Available as 4x8 or 8x8 nonblocking, full fan-out matrices with 50 ohm characteristic impedance. Available with BNC, or SMA connectors. 19" rackmount chassis, 7" high. See page CX-3 of bulletin for complete specifications.

CXL MAINFRAMES -- DC to 700 MHz
Affordable 8x8 blocking matrix with 50 ohm characteristic impedance. Available with BNC, SMA or user specified connectors. 19" rackmount chassis, 3.5" high. No LED indicators. See page CX-4 of bulletin for complete specs.

CONTROL OPTIONS

IF-5 IEEE488/RS232
This Module has both the IEEE488 (Talk /Listen) and the RS232 features detailed in Applications Bulletin AP-5.

IF-6 LAN INTERFACE
This Module uses TCP/IP to allow control from a Local Area Network as described in Applications Bulletin AP-5.

MANUAL CONTROL OPTIONS

M/128-TW OR M/256-TW THUMBWHEEL CONTROLS
This manual control uses a thumbwheel selector and strobe button to select switchpoints.

MC/2 KEYPAD MANUAL CONTROL W/ LCD DISPLAY
This manual control has a keypad and LCD display of last command.

### VMC VIRTUAL MANUAL CONTROL SOFTWARE
The VMC Software allows the remote operator to view the Status of the Matrix and to Control Switch Selection using a full Graphical User Interface.   All Windows based versions are available. Free with any system purchase.

CXB SERIES MODULAR SWITCH MATRIX

The CXB Series of Modular Coaxial Switch Matrices provide incremental matrix sizes from 2x4 or 1x8 up to 32x4 or 16x8. 50 ohm signals from DC to 50 MHz can be switched, with isolation of -50 dB at 50 MHz. Up to 16 CXB Switch modules and CL8 Display modules are plugged into the coaxial motherboard to supply the required matrix configurations as shown in Figs. 1 and 2. The CL8 Display modules provide visual indication of switch status to aid in troubleshooting test routines and debugging programming. The modules are available with Type S dry reed relays or Type M mercury wetted reed relays for up to 50 watt switching.

CXB CHASSIS

CXB/16x8 and **CXB/32x4** Mainframes and Expansion Chassis are built for either Nx8 or Nx4 Matrix configurations, where the number of installed switch modules determines the number of connections in the N direction. All systems are completely bidirectional, so either side of the matrix may be considered inputs or outputs. Expansion chassis are used with a MESA Control chassis for cost effective configuration of matrix sizes which exceed the limits of a single chassis. See the **MESA Bulletin** for details on building larger systems.
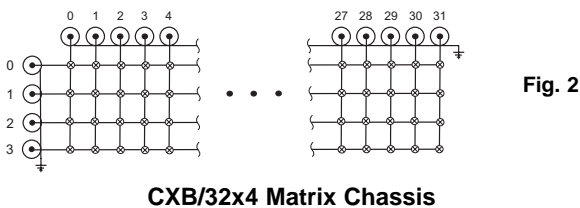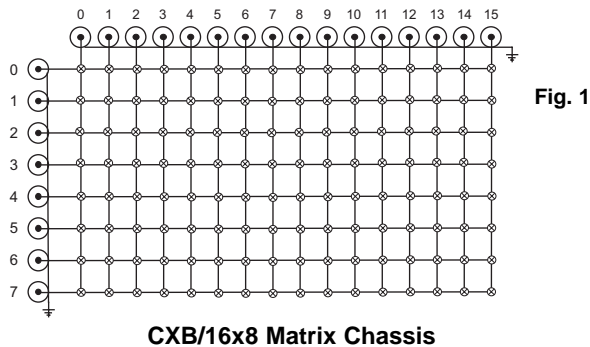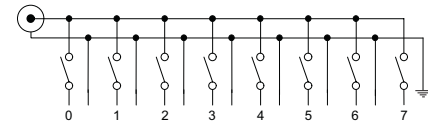

CXB/16x8 or 32x4 Matrix

CXB SWITCH MODULES

CXB/1x8-1S or -1M SWITCH MODULE

These modules are used with CXB/16x8 Chassis to provide Nx8 matrices. Each module supplies one connection in the N direction as shown in **Fig. 3**, and a total of 16 modules will form a 16x8 matrix. Each switch module requires one CL8 Display/Driver module.
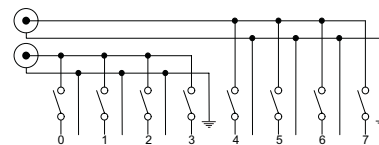

Fig. 3

CXB/2x4-1S or -1M SWITCH MODULE

These modules are used with CXB/32x4 Chassis to provide Nx4 matrices. Each module supplies two connections in the N direction as shown in **Fig. 4**, and a total of 16 modules will form a 32x4 matrix. Each switch module requires one CL8 Display/Driver module.

Fig. 4

Fig. 1

**CXB/16x8 Matrix Chassis**

Fig. 2

CXB/32x4 Matrix Chassis

CXE/32x8 MODULAR MATRIX

The CXE/32x8 Matrix uses CXE/2x8 Switch Modules to form modular systems in the same manner as the CXB systems shown above. Each switch module has 16 single pole coaxial relays configured as a 2x8 matrix with additional isolation relays as shown in Fig. 5. Installing up to 16 modules in the matrix chassis allows the formation of matrices up to 32x8 as shown in Fig. 6. Each CXE Switch Module requires one CLE/16 Display Module for control and LED display of selected relays. All remote control options are available. A fully populated CXE/32x8 has a bandpass of DC to 50 MHz (-3dB) with Isolation of -50 dB at 50 MHz. Inputs and outputs are fully bidirectional and use BNC connectors.
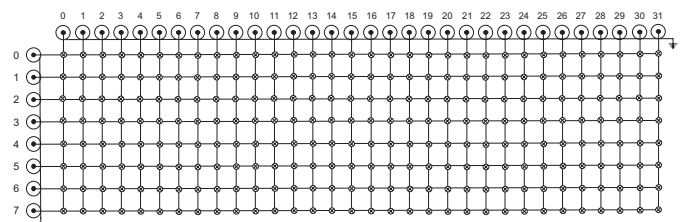

Fig. 5
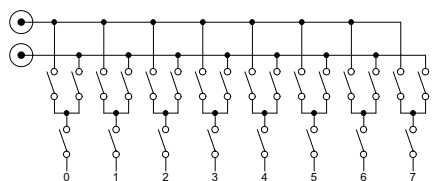
CXE/2x8 Switch Module

Fig. 6

CXE/32x8 Matrix
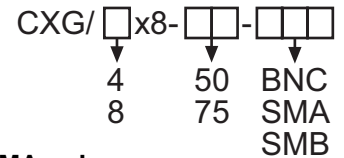
CXG SERIES DC to 700 MHz COAXIAL MATRIX

CYTEC's CXG Series of coaxial tree switch matrices are available as 4x8 or 8x8 nonblocking configurations in 50 or 75 ohm characteristic impedance. The tree switch topology shown in Fig. 7, provides excellent attenuation and crosstalk specifications from DC to 700 MHz. The use of electromechanical relays make these systems completely bidirectional and capable of hot switching signals up to 24 watts. 50 ohm systems are available with BNC, SMA or other user specified connectors. 75 ohm systems are available with BNC or SMB connectors. Any of CYTEC's standard control modules may be specified as well as the MC/2 Keypad manual control.

Fig. 7

SPECIFICATIONS

Bandpass(50 ohm)	DC to 700 MHz (-3 dB)
Bandpass(75 ohm)	DC to 500 MHz (-3 dB)
Isolation	-60 dB to 700 MHz
VSWR	<1.4
Impedance	50 or 75 ohm
Switched Power	24 watts max
Switch speed	10 ms
Signal Connections	See below
19" rackmount Size	7" high, 15.6" deep
Weight	Approximately 25 lbs

How to order:

CXG/ ☐x8-☐☐-☐☐☐

4	50	BNC
8	75	SMA
		SMB

50 ohm systems BNC or SMA only
75 ohm systems BNC or SMB only

# CXF SERIES FULL FANOUT 5-500MHz COAXIAL MATRIX

This system is a nonblocking (any input to any output), full fan out (any input to any or all outputs), 50 ohm coaxial switch matrix available in 4x8 or 8x8 configurations as shown in Fig. 8. Larger configurations can be supplied using multiple Expansion Chassis and a MESA Control Chassis. Systems are built with BNC or SMA as standard connectors. Other connector styles available on request. The matrix has LED visual display of latched switch paths and is available with any of the standard control modules.

Fig. 8

SPECIFICATIONS

Bandpass	5 MHz to 500 MHz (+/- 2 dB)
Isolation	-65 dB to 500 MHz
VSWR	<1.6:1 to 500 MHz
Impedance	50 ohm
Switched Power	+2.0 dBm
Switch Speed	10 ms
Signal Connections	SMA or BNC on rear panel
19" Rackmount	7" high, 15.6" deep
Weight	Approximately 25 lbs

How to order:

CXF/ ☐x8-50-☐☐☐

| 4 | BNC |
| 8 | SMA |
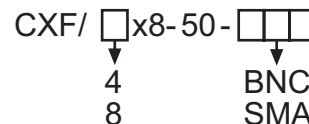
CXL SERIES 8x8 BLOCKING MATRIX

The **CXL/8x8 blocking matrix is a compact and affordable, DC to 700 MHz coaxial 8x8, bidirectional matrix as shown in Fig. 9. The system will allow any input to be connected to any output but requires that the entire switch is reconfigured in order to establish a new path. This may cause a momentary disconnect in previously set paths when a new connection is desired.**

The CXL/8x8 is an extremely cost effective solution for tests which are not reconfigured during the test run, or can tolerate momentary loss of signal during reconfiguration.

SPECIFICATIONS

Bandpass	DC to 700 MHz (-3 dB)
Isolation	-60 dB to 700 MHz
VSWR	< 1.4 to 700 MHz
Impedance	50 ohms
Max Switched Power	24 Watts
Max Switched Current	1 Amp
Relay type	High frequency Armature
Connectors	BNC or SMA
Configuration set-up time	0.1 seconds
Chassis Dimensions	19" rackmount, 3.5" high, 15.6" deep
Weight	15 lbs
Power Consumption	< 50 Watts with all paths closed

Fig. 9

Blocking
8x8
Bidirectional
Switch
Fabric
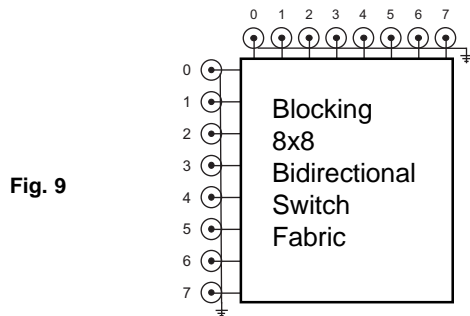
RELAY SPECIFICATIONS

Three types of relays are used in CX Series Matrices:

Type S Reed Relay - This is a single pole Form A dry reed switch for low power applications.

Type M Reed Relay - This is a single pole Form A mercury wetted reed switch for higher power applications.

Type A Armature Relay - This is a single pole Form C armature relay for RF applications.

The **CXB Series** is available with either **Type S** or **Type M**.
The **CXE Series** uses **Type S** only.
The **CXG, CXF and CXL Series** all use **Type A** relays.

Reed relays are guaranteed for 100 million operations, and Armature relays are guaranteed for 1,000,000 operations if used within the following ratings:

	Type S	Type M	Type A
Contact Rating	10VA	50VA	24 Watts
Switch Voltage	200V	500V	24V
Switch Current	0.5A	2.0A	1A
Breakdown Voltage	400V	1000V	200V
Operating Time	1ms	2ms	10ms

GENERAL SPECIFICATIONS

WEIGHT - 30 lbs. max for full systems.
POWER -   100-130 VAC or 200-240 VAC 50-60 Hz
POWER CONSUMPTION - < 100 watts.
ENVIRONMENT - Operating at 0°C to 50°C.
Storage at -25°C to 65°C.

AVAILABILITY - Most systems available 30 days ARO.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Material and Workmanship for a period of 5 years and that all switches are guaranteed for their Rated Operations. A 10 year warranty/service agreement is available with the purchase of specified spare parts.

RAM OPTION

This option is available with the IF-5 Control Module and allows up to 100 Switch selections to be stored in memory.
It also allows automatic reset to specific configurations on Power Up.

SOFTWARE

Drivers and Sample Programs are available for the most common programming languages. These check the entire system by cycling through all switches, sequentially latching and unlatching each switch while checking Status.

CONTACT 1-800-346-3117 OR WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE

YTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   FAX (585) 381-0475

CXAR AND CT SERIES
COAXIAL SWITCHING SYSTEMS

The CXAR and CT Series are Computer Controlled Coaxial Switching Systems for High Frequency Signals up to 1.6 GHz. These systems are typically used to configure 1xN multiplexers. Pre-wired Mainframes and Expansion Chassis will accept a variety of control and switch modules to form the desired configuration.

FEATURES:
- **Bandpass from DC to 1.6 GHz with low crosstalk.**
- **Computer Control from IEEE488 BUS, RS232 Serial, and 10BaseT LAN.**
- **Front Panel Display and Status Feedback to Computer.**
- **Manual Control Option.**

CHASSIS
The **CXAR** Units are 19" rack mounted chassis, and are available as either Mainframes or Expansion Chassis pre-wired to accept any of the CXR Series of Coaxial Switch Modules. All chassis have front panel LED indication of latched switch points and have the switch modules mounted through the rear panel.

The **CT** Units are the same but accept 2x1 modules only and are described on the last page.

SWITCH MODULES
There are three series of Modules all using relays interconnected by striplines to give the required characteristic impedance for high bandpass.
CXR Series use coaxial reed relays and are available with a bandpass up to 300 MHz.
CXR-G Series use armature relays in a tree configuration and have a bandpass exceeding 1 GHz.
CXR-2A Series use a two pole armature relays to switch balanced line signals and have bandpass up to 200 MHz.

SWITCH CHARACTERISTICS
CXR Modules are available with Standard Reed **Type S** or Terminating Reed **Type T** relays.
CXR-G Modules use High Power Armature **Type G** relays.
CXR-2A Modules use Two Pole Armature **Type 2A** relays.

	Type S	Type T	Type G	Type 2A
Contact Rating	10VA	3VA	24VA	60VA
Switch Voltage	200V	200V	24V	110 V
Switch Current	0.5A	0.25A	1.0A	1.0A
Breakdown Voltage	400V	200V	1000V	750V
Operating Time	1ms	1ms	10ms	3 ms
Life Expectancy*	10^8	10^8	10^7	$2x10^5$

*Life expectancy is at rated load
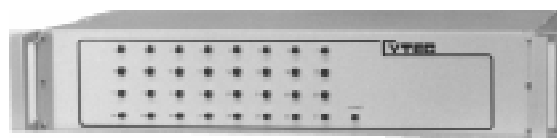
CXAR/32 Mainframe

LED DISPLAYS
CXAR/16, **CT/16** and **CT/32** Chassis include front panel LED display of switchpoint status. **CXAR/64, CXAR/128**, **CT/64** and **CT/128** Chassis require one separately purchased CL8 Display module for each eight switch points. This LED indication is an invaluable aid in program debugging and determining system status.

CONTROL MODULES
IF-3B or 3C RS232 CONTROL MODULE
This Module has all the RS232 features detailed in Applications Bulletin AP-5. The IF-3B is used on 16 channel chassis. The IF-3C is used on 32 channel chassis.
IF-4B or 4C IEEE488 BUS (TALK/LISTEN)
This Module has all the IEEE488 features detailed in Applications Bulletin AP-5. The IF-4B is used on 16 channel chassis. The IF-4C is used on 32 channel chassis.
IF-5 IEEE488/RS232
This Module has both the IEEE488 (Talk/Listen) and the RS232 features detailed in Applications Bulletin AP-5. This combination module is used on all 64 or 128 channel chassis.
IF-6 LAN INTERFACE
This Module uses TCP/IP to allow control from a Local Area Network as described in AP-5. It is available as an option on any unit with RS232 Control.

MANUAL CONTROL OPTION
Manual Controls are available for all chassis types.
CXAR/16 and **CTC/16** Chassis utilize momentary pushbutton manual controls **MC/16**.
CXAR/32, /64 and /128, CTA/32, /64, /128, CTC/ 32, and /64 chassis utilize Thumbwheel Manual Controls **MC/32, /64 and /128** respectively.

VMC VIRTUAL MANUAL CONTROL SOFTWARE
VMC Software allows the switches to be controlled through a Graphical User Interface. Current version is Windows based. Free with any system purchase.

FOR TECHNICAL ASSISTANCE, CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM

CXAR CHASSIS

The CXAR Chassis are 19" rack mounting units with power supplies and are pre-wired to accept the CXR Series of Switch Modules. The Switch Modules are mounted so that the connectors protrude through the rear panel. The front panel provides LED indication of switch status and optional manual controls. The following Units are available:

CXAR/16 and CXAR/32 MAINFRAMES
These Chassis control up to 16 or 32 switch points in any configuration. LEDs on the front panel show Switch and Power Status. Add Switch Module(s) and a Control Module to complete the system. Standard Chassis depth is 12". Chassis height is typically 3.5". See Drawing Pages following this bulletin..

CXAR/64 and CXAR/128 MAINFRAMES
These Chassis control up to 64 or 128 switch points in any required configuration. Add Switch Modules, CL8s and a Control Module to complete the system. The CL8s provide LED indication of Switch Status through the front panel. Standard Chassis depth is 12". Chassis height is determined by Switch Module selection and configuration but is typically 5.25", 7.0" or 8.75". See Drawing Pages following this bulletin.

CXAR EXPANSION CHASSIS
All CXAR Chassis are available as Expansion Chassis for use with a MESA Control Chassis. This allows configuration of large or complex systems with one point of control.
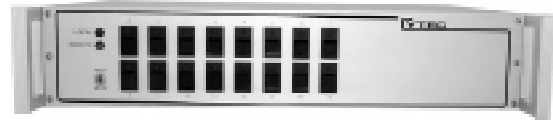
CXAR/16 With Pushbutton Manual Control
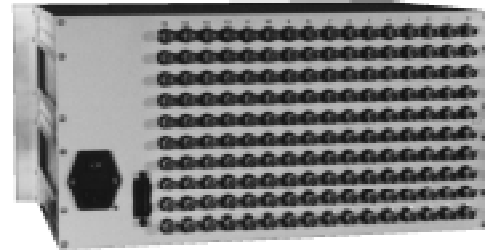
CXAR/128 Rear View

CXR SERIES SWITCH MODULES

The CXR Series of Switch Modules have Coaxial Relays interconnected by characteristic impedance striplines to connectors on both bi-directional inputs and outputs. Isolation relays on the commons reduce crosstalk between interconnected modules.

CXR/8x1-1T
This module has single pole **Type T** relays which terminate the inputs to the required impedance as shown in **Fig. 1**. Energizing the selected relay removes the termination from the input and closes the circuit.

CXR/8x1-1S
This is the same configuration but without termination.

CXR/4x1-1T
This is the same terminated configuration with only four relays.

CXR/4x1-1S
This is the same configuration with only four relays and without terminations.

CXR/2x1-1S (Form A)
This module switches a common port between A, B or OFF positions as shown in **Fig. 9** (seen on last page of bulletin). Module uses single pole, **Type S** or **Type M** reed relays.

CXR/2x1-2S (Form A)
Same as above with two pole relays.

CXR/8x1-2A
This is an 8x1 two pole configuration as shown in **Fig. 3**. Great for switching balanced line 100 ohm differential pairs. It is available with isolated BNC's or Twin BNC connectors (Twinax), and uses **Type 2A relays.**

CXR/4x1-2A
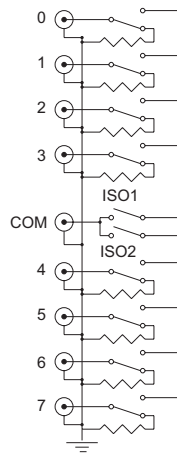This is the same 2 wire module but as a 4x1 configuration.

Fig. 1

Fig. 3

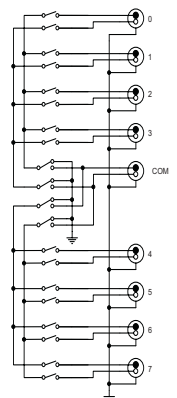### CXR/8x1-1HT
This is a High Isolation Module with relays which terminates the inputs to the required impedance and have additional isolation relays as shown in **Fig. 2**, which decrease the crosstalk between channels by 20dB. Energizing a relay removes the terminating impedance and completes the selected path.

CXR/8x1-HS
This has the same high isolation characteristics as the model -1HT but without input termination.

CXR/4x1-1HT
This has the same characteristics and configuration with only four relays.

CXR/4x1-1HS
This is the same as the model -1HT but without termination.
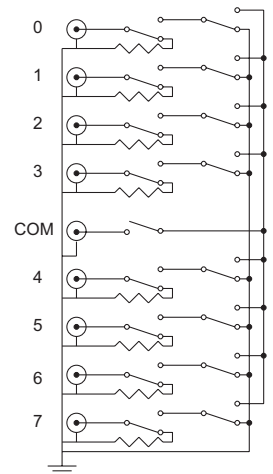

Fig. 2

HIGH FREQUENCY SPECIFICATIONS

Type	Bandpass MHz	Isolation at 100 MHz
CXR/xxx-1 & 1T	360	60dB
CXR/xxx-H1S & H1T	300	70dB
CXR/xxx-2A	200	45dB

CXAR-2

CXR-G SWITCH MODULES

These modules are designed with Type G relays arranged in a tree configuration as shown in Figs. 4 thru 6 with on board logic which selects the appropriate relays to connect the selected input to the common. Only one input can be switched to one output and in the unenergized state input #0 is connected to the common except the terminated modules which have an open condition.

The Modules are available with 50 ohm or 75 ohm characteristic impedance and with SMA, SMB or BNC connectors.

Combinations of these modules can be assembled to form larger multiplexers or matrices.

CXR/8x1-G

This module is a bidirectional 8x1 configuration as shown in **Fig. 4** and is available for both **50** or **75** ohm impedance signals.

50 ohm models are available with either **SMA or BNC** connectors.

Bandpass with **SMA** connectors is **1.6 GHz** (-3dB).
Isolation is **-50dB** at 1 GHz.
Bandpass with **BNC** connectors is **1.0 GHz** (-3dB).
Isolation is **-50dB** at 1 GHz.
75 ohm models are available with either **SMB** or **BNC** connectors.

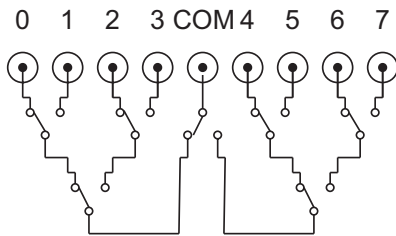**Bandpass** is **1.2 GHz** (-3dB) and **isolation** is **-50dB** at 1 GHz.

Fig. 4

CXR/4x1-G

This module is a bidirectional 4x1 configuration using connectors 0 thru 3 of **Fig. 4**.
It is available with the same connectors and has the same bandpass and isolation as the 8x1 module.

CXR/4x2-G

This module switches any two of 4 coaxial ports to the two commons as shown in **Fig. 5**, and is available for both **50** or **75 ohm** impedance signals.

50 ohm modules are available with **SMA** or **BNC** connectors.
Bandpass with **SMA** connectors is **1.2 GHz** (-3dB)
Isolation is **-50dB** at 1GHz.
75 ohm modules are available with **SMB** or **BNC** connectors.
Bandpass is 800 **MHz** (-3dB).
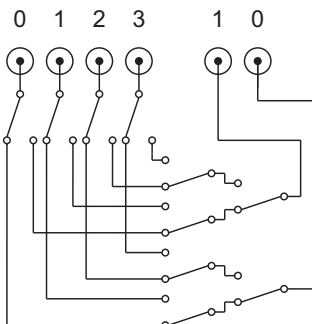**Isolation** is **-50dB** at 1 GHz.

Fig. 5

CXR/8x1-GT TERMINATED MODULE

This module switches any one of eight **50** or **75** ohm terminated coaxial inputs to one output as shown in **Fig. 6**. Switching any input removes the termination from that input and connects it to the common.

50 ohm models are available with either **SMA or BNC** connectors.

Bandpass with **SMA** connectors is **1.5 GHz** (-3dB).
Isolation is **-60dB** at 1 GHz.
Bandpass with **BNC** connectors is **1.0 GHz** (-3dB).
Isolation is **-60dB** at 1 GHz.
75 ohm models are available with either **SMB** or **BNC** connectors.

Bandpass is **1.0 GHz** (-3dB) and **isolation** is **-60dB** at 1 GHz.
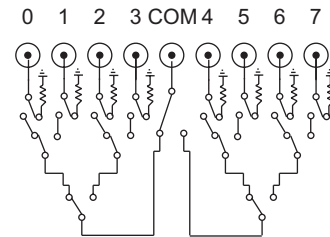
Fig. 6

CXR/4x1-GT TERMINATED MODULE

This module switches any one of four coaxial inputs to common using inputs 0 thru 3 of **Fig. 6**.
It is available with the same connectors and has the same bandpass and isolation as the 8x1 module.

CXR/1x8-PD POWER DIVIDER MODULE

This module is a 1x8 power divider intended for use between 5 MHz and 500 MHz. The module has a unity gain amplifier so that all 8 outputs maintain the signal input level (+/- 2 dB) in the given frequency range. The module is available with **SMA** or **BNC** connectors. A schematic is shown in **Fig. 7**.
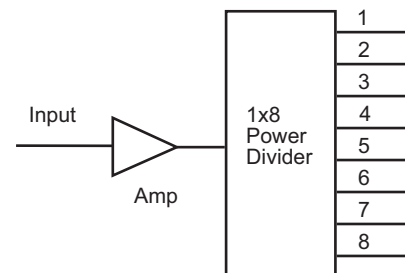
Fig. 7

CTC AND CTA A/B SWITCH CHASSIS

CTC and CTA Chassis are designed to control either Form C A/B switches (no off position) or Form A A/B switches (A, B or Off positions). These chassis are commonly used to sub multiplex larger systems or act as stand alone fail safe redundancy systems. Systems are configured according to whether they require one drive per module (Form C versions) or two drives per module (Form A versions). All chassis are available as Expansion chassis for use with MESA Controllers in larger systems.

CTC CHASSIS

CTC/16 MAINFRAME OR -E EXPANSION CHASSIS
Controls up to 16 form C switch modules. See Drawing Pages following this bulletin.

CTC/32 MAINFRAME OR -E EXPANSION CHASSIS
Controls up to 32 form C switch modules. See Drawing Pages following this bulletin.

CTC/64 MAINFRAME OR -E EXPANSION CHASSIS
Controls up to 64 form C switch modules. See Drawing Pages following this bulletin.

CTA CHASSIS

CTA/32 MAINFRAME OR -E EXPANSION CHASSIS
Controls up to 16 form A switch modules. See Drawing Pages following this bulletin.

CTA/64 MAINFRAME OR -E EXPANSION CHASSIS
Controls up to 32 form A switch modules. See Drawing Pages following this bulletin.

CTA/128 MAINFRAME OR -E EXPANSION CHASSIS
Controls up to 64 form A switch modules. See Drawing Pages following this bulletin.

CXR 2x1 (A/B) SWITCH MODULES

The CXR/2x1 Switch Modules may be used in any CXAR or CT Chassis. For large numbers of 2x1's, the CTA and CTC Chassis listed above should be ordered, but any of the 2x1 Modules may be mixed with 8x1 or 4x1 modules in the chassis listed in previous sections. Please contact CYTEC for labeling options on chassis that mix multiple module sizes.

CXR/2x1-G (Form C)

This module switches the common to one of two inputs as shown in **Fig. 8**. In the unenergized position, the common is connected to input A. It is available with **50** or **75 ohm** impedance. **50 ohm** modules use **SMA**, **SMB** or **BNC** connectors

Bandpass is **2.5 GHz** (-3 dB).
Isolation is -**60 dB** at **1 GHz**.
75 ohm modules use **SMB** or **BNC** connectors.
**Bandpass** is **1.5 GHz** (-3dB).
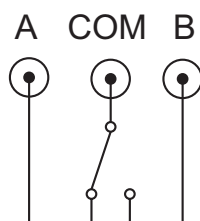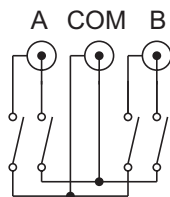**Isolation** is **-60dB** at **1 GHz**.

Fig. 8

CXR/2x1-1S or -2S (Form A)

This module switches a common port between A, B or OFF positions as shown in **Fig. 9**. Module uses single or two pole, **Type S** or **Type M** reed relays. **Bandpass** is **400 MHz** (-3 dB). **Crosstalk** is **-60 dB** at **5 MHz.**

Fig. 9

CXR/2x1-2C (Form C)

A two pole 2x1, Form C configuration as shown in **Fig. 10** which allow one input to be switched to two outputs (A or B). Available with **BNC** or **Twin BNC** connectors, and uses **Type A**, Armature relays.

CXR/2x1-GT (Form A)

This module is a version of the CXR/2x1-G module that has the unused A/B connection terminated into **50** or **75** ohm resistors as shown in **Fig 11**. This module allows an off state with both inputs terminated. It is available with **50** or **75 ohm** impedance. **50 ohm** modules use **SMA** or **BNC** connectors

Bandpass is **2.5 GHz** (-3 dB).
Isolation is -**60 dB** at **1 GHz**.
75 ohm modules use **SMB** or **BNC** connectors.
Bandpass is **1.5 GHz** (-3dB).
Isolation is **-60dB** at **1 GHz**.
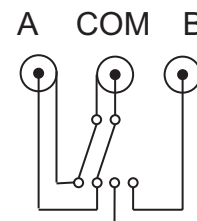
Fig. 10
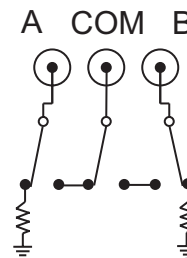
Fig. 11

CXBS COAXIAL BUS STRIPS

The Bus Strips are used to connect between CXR Coaxial Switch Modules and are designed for maximum bandpass and minimum stub length. They are available to interconnect up to 16 modules. Can not be used with **Type G** or **Type 2A** Modules.

CXBS/8 Bus Bar shown in drawing
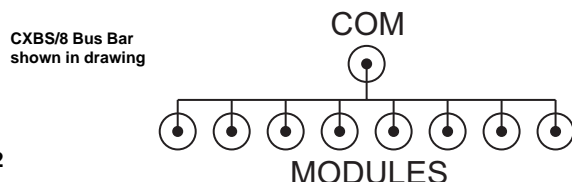
Fig. 12

CX/G AMPLIFIER

This amplifier has one BNC input and up to 3 BNC outputs. It can be used to restore signal levels or as a Signal Distributor to 3 Devices, as shown in **Fig. 13**.

It has a **Bandpass** of **DC to 200 MHz** with a 4 volt p/p output and preset gains from 1 to 16.

Impedances on both inputs and outputs can be preset for impedance matching.

Fig. 13

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   FAX (585) 381-0475

CXM SERIES
MICROWAVE SWITCHING SYSTEMS

CYTEC's CXM Series Microwave Switching Systems are computer controlled units that are designed to switch 50 ohm coaxial microwave signals. These are passive, bidirectional devices. Two basic configurations are available: Nx1 Multiplexers and NxM nonblocking (but not full fanout) Matrices. Bandpass depends on switching topology, but DC to 40 GHz is possible. Control options include RS232, IEEE488, Ethernet LAN and USB. Manual Control is also available.

CXM CHASSIS

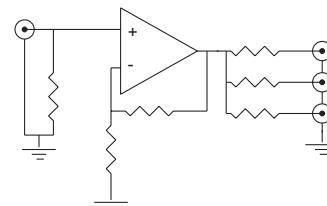**The CXM units are all 19" rack mounting chassis and are available either as Mainframes or Expansion Chassis. Standard units provide from 16 to 256 individual switch points. The basic unit holds the required power supplies, a Control Module, Switch Modules and an optional Manual Control.**

CXM/16 & CXM/32 CHASSIS
These chassis furnish 16 and 32 individual switch points with discrete front panel LEDs displaying switch status.

CXM/64 and CXM/128 CHASSIS
These chassis provide 64 and 128 switch points. The units require a **CL8-VHP Display Module** for every eight switch points. The CL8-VHP Module controls the Microwave Switch Modules and has LEDs which show switch point status through the front panel.

CXM/256 CHASSIS
This chassis provides 256 switch points. The unit requires a **CLE16-VHP Display Module** for every 16 switch points. The CLE16-VHP Module controls the Microwave Switch Modules and has LEDs which show switch point status through the front panel.

EXPANSION CHASSIS

This chassis is similar to the Mainframe except it is built without Control Modules. It is controlled by a MESA Chassis as described in the **MESA Bulletin**.

CUSTOM CHASSIS

Custom configurations are available on request. As an example, switch modules from other product lines can be combined in one chassis to furnish a single test stand for multiple signal types. In addition, other microwave devices such as **Couplers**, **Splitters**, **Attenuators** and **Amplifiers** can be combined to provide a complete Microwave test system.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Material or Workmanship for a period of 5 years, with the exception of the Microwave relays, which are warrantied for only one year.
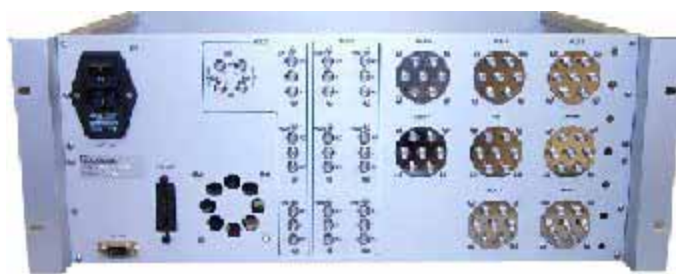
Fig.1   CXM/128 Mainframe

CONTROL OPTIONS

IF-5 IEEE488/RS232 COMBINED CONTROL
This Module has both the IEEE488 (Talk/Listen) and the RS232 features detailed in Applications Bulletin AP-5. This module is installed in the CXM/64, CXM/128 and CXM/256 Chassis.

IF-5C IEEE488/RS232 COMBINED CONTROL
This module has the same features as the IF-5 except it is only installed in the CXM/16 and CXM/32 Chassis

IF-6 LAN INTERFACE
This module furnishes control from a Local Area Network via TCP/IP protocols as described in Applications Bulletin AP-5.

IF-7 RS232/UNIVERSAL SERIAL BUS INTERFACE
This module has full functionality with both Serial Protocols. USB will probably replace RS232 on future computers.

MANUAL CONTROL

MC-2 WITH LCD DISPLAY
This has a Keypad and LCD Display on the front panel so that the operator can select any relay and verify that the relay has been selected. This option is available on the CXM/64, CXM/128 and CXM/256 Chassis.

VMCS
This Virtual Manual Control Software enables a remote operator to view the Status of the Matrix and to Control Switch Selection using a full Graphical User Interface.

PB/16 and PB/32 PUSHBUTTON
Individual Pushbuttons select and control mainframes holding either 16 or 32 individual switchpoints. This option is available on the CXM/16 and CXM/32 Chassis.

CONTACT 1-800-346-3117 OR WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE

CXM MULTIPLEXERS and MATRICES

Fig. 2 CXM/64 Mainframe configured as two independent 29x1 Multiplexers

CXM MATRICES

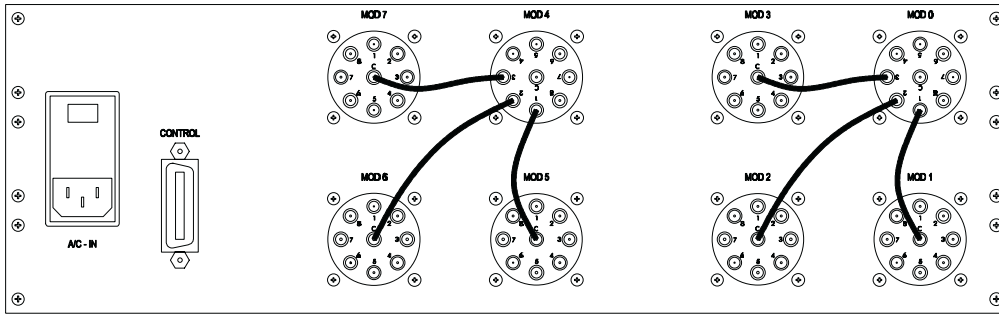Bidirectional NxM Matrices are assembled by interconnecting the required number of individual microwave switches as shown in **Fig. 3**. The matrix is nonblocking, but not full fanout. Nonblocking means that any input can be connected to any output without interrupting a previously set path. When a matrix is not full fanout, an input may be switched to only one output. Matrix configurations from 2x2 to 8x8 or larger are possible. The switches and interconnects are assembled inside the chassis. The input and output connectors (typically SMAs) are mounted on the rear panel.
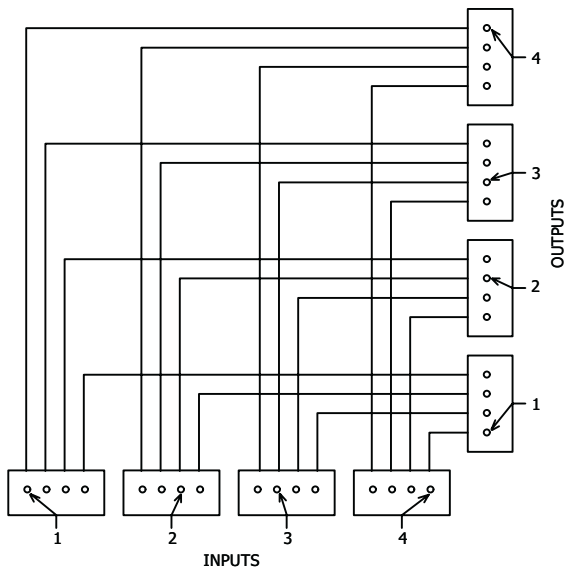

Fig. 3   4x4 Matrix Using Eight CXM/4x1 Switches

CXM MULTIPLEXERS

Nx1 Multiplexers are assembled from standard CXM Chassis by interconnecting microwave switch modules as shown schematically in **Fig. 4**. The interconnects are typically semi-rigid coaxial cables and are wired on the rear panel as shown in **Fig. 2**.
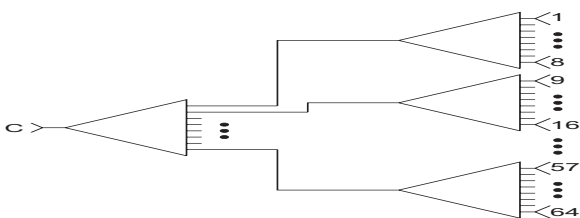

Fig. 4   16x1 Multiplexer using five CXM/4x1 Switches

CXM SWITCH MODULES

Standard CXM Switch Modules are bidirectional, failsafe, Normally Open switches with a bandpass of DC to 18 GHz. Configurations from 1x2 to1x10 are available and SMA connectors are standard. Optional features include: Failsafe default to port 1 closed, latching actuators, TNC or N connectors, unused input ports terminated to 50 ohms and higher power handling capability. Standard CXM Switch Modules are listed below.

CXM/1X2 SWITCH MODULE

This is a SPDT Microwave Relay. Options include connector type, higher power handling capability and unused port termination and latching versions.

CXM/2x1-F-SMA

CXM/1X4 SWITCH MODULE

This is the same as above, but is a SP4T configuration.

CXM/1X6 SWITCH MODULE

This is the same as above, but is a SP6T configuration.

CXM/1X8 SWITCH MODULE

This is the same as above, but is a SP8T configuration.

CXM/6x1-F-SMA

CXM/1X10 SWITCH MODULE

This is the same as above, but is a SP10T configuration.

SWITCH MODULES SPECIFICATIONS

Microwave Switch Specifications vary depending on options. The following are typical.

	1 GHz	18 GHz
Insertion Loss	0.3 dB	0.8dB
Isolation -80dB		-60dB
VSWR	<1.2:1	<1.5:1
Switching Time	<15ms	<15ms

Specifications are for switches only. Cableing or connector options will decrease certian specifications. Call for specifications on assembled systems.

CL8-VHP DISPLAY/DRIVER MODULE

The **CXM/64** and **CXM/128** Chassis require one CL8-VHP per every eight switch points. These modules control the microwave switches and have LEDs that show switch point status and are visible through the chassis front panel.

CLE16-VHP DISPLAY/DRIVER MODULE

The **CXM/256** Chassis require one CLE16-VHP per every 16 switch points. These modules control the microwave switches and have LEDs that show switch point status and are visible through the chassis front panel.

CXM-1

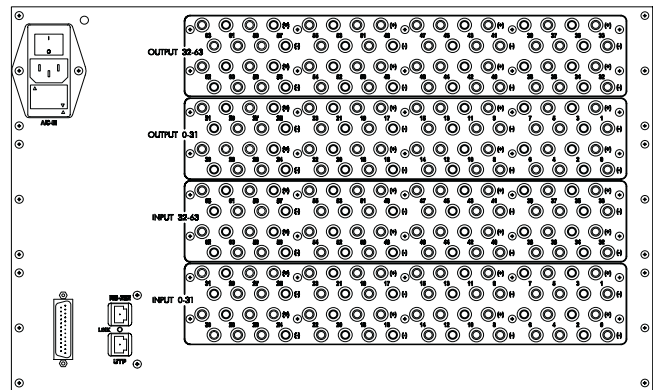# DX SERIES 64x64 HIGH SPEED DIGITAL SIGNAL SWITCH MATRIX

The DX Series Digital 64x64 Matrix switches single-ended or differential signals up to 2.0 Gbps. Available for ECL, PECL, LVPECL, LVDS, CML, HDTV or many other digital signal types. Input and output transition boards supply level translations, signal conversion or alternate connector options.

SYSTEM FEATURES:

• Available in incremental matrix sizes from 16x16 to 64x64.

• Matched path lengths for low skew.

• Rise and Fall times as fast as 150 psec (20% to 80%).

• Completely nonblocking (any input to any output).

• Full fan-out (any input to several or all outputs).

• Available as dual differential Clock and Data Matrices.

• Jitter correction feature actually improves poor signals.

• Multiple connector options.

• Computer control via GPIB, RS232 or Ethernet.

• Optional front panel Manual Control with LCD display.

• Remote Status Feedback of all switch positions.

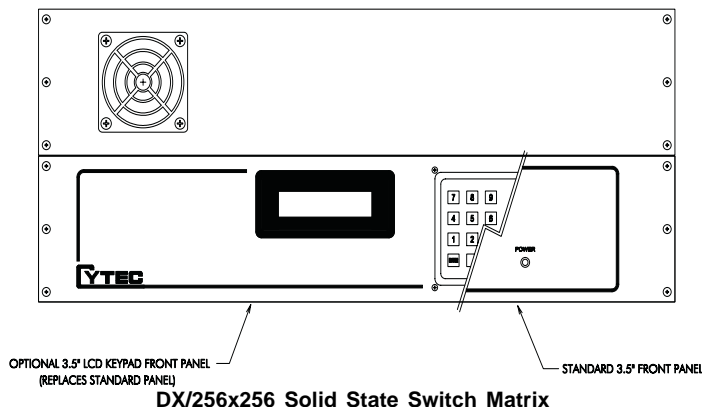• Full five year warranty.

Prices starting at $20,000.00
Availability: 60 days ARO.

DX Series 64x64 Differential ECL/PECL Matrix Rear

This system incorporates an advanced solid state switch fabric that helps restore signal levels, corrects deterministic jitter and cleans up rise time problems associated with wiring and cable runs.   Input and Output Transition Modules are also separately available that perform signal conversions in applications which do not require switching. Call CYTEC's Sales Department to discuss your application.

NEW SOLID STATE DX SERIES 256x256 DIGITAL SWITCH MATRIX

OPTIONAL 3.5" LCD KEYPAD FRONT PANEL
(REPLACES STANDARD PANEL)

STANDARD 3.5" FRONT PANEL

DX/256x256 Solid State Switch Matrix

The Solid State DX/256x256 Solid State Series is a very high density, low cost switch matrix that is designed to switch digital TTL or CMOS signals up to 40 Mbps (80 Mbps NRZ). Input and Output Transition Modules can be provided for differential signals or level conversion allowing for signal types such as RS232, RS422 or almost any digital data stream. Optional Patch or Breakout Panels furnish almost any connector type specified by the end user. The Matrix may be configured for multiwire switching, such as a Dual Clock and Data Matrix or Rx and Tx signals.

Prices starting at $20,000.00
Availability: 60 days ARO.

SOFTWARE

Free Example/Driver programs are available for most modern Operating systems. Platforms include: C, Visual Basic, Java, LabView and LabWindows.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Material or Workmanship for a period of 5 years and that all switches are guaranteed for their rated operations.

• Applications include TTL, CMOS, RS232 and RS422 data.

SYSTEM FEATURES:

• Available in incremental sizes from 64x64 to 256x256.

• Completely nonblocking (any input to any output).

• Full fan-out (any input to several or all outputs).

• Available as dual differential Clock and Data Matrices.

• Multiple connector options.

• Computer control via GPIB, RS232, or Ethernet.

• Optional front panel Manual Control with LCD display.

• Remote Status Feedback of all switch positions.

• Full five year warranty.

CONTACT 1-800-346-3117, SALES@CYTEC-ATE.COM OR WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE AND A COMPLETE CATALOG WITH PRICING!

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526 (585) 381-4740 FAX (585) 381-0475

DX SERIES
SOLID STATE DIGITAL SWITCHING SYSTEMS

CYTEC's DX Series Switching Systems are based on solid state switch fabric. The Standard DX system is designed to switch TTL, CMOS, LVTTL, IRIG, RS232 and RS422. Input and output buffers are used to convert to RS422 and/or RS232 signal levels. The DX is capable of switching data rates to 80 Mbps NRZ. The DX Matrix is a nonblocking, full fan-out configurations from 64x64 up to 256x256. Control options include RS232/ IEEE488, LAN or LCD Keypad Manual Control.

DX/256X256 CHASSIS

The DX/256X256 Series are 19" rack mounting units and are built as either Mainframe or Expansion Chassis. The Solid State Digital Matrix is modular, capable of being expanded from a 64x64 to a 256x256 by adding the desired number of input and output modules. The configurations occur in 64 channel increments so typical configurations will be 64x448, 128x384, 256x256, etc. Other possible configurations such as dual 12x12 clock and data matrices or multi chassis clock and data systems are also available. The DX Series Matrix is completely nonblocking and full fan-out.

DX/256x256 Mainframe Rear View

DX/256X256 MAINFRAME

The Standard Mainframes are built with power supplies, user specified Control Module and optionally Keypad LCD Display Manual Control. The system is completely modular by adding the desired number of DX/64 Input and Output Switch Modules defined on page 2 of the bulletin.

DX/256x256-E EXPANSION CHASSIS

The expansion chassis is identical to the mainframe in size and function. The expansion chassis, however, is built without a dedicated control module, manual control or power supplies. Instead, it is designed to be both powered and controlled by one of CYTEC's MESA Control Chassis detailed in the **MESA Bulletin**. Ribbon Expansion Cables connect the expansion chassis to the MESA.

CUSTOM CHASSIS

Custom configurations are available upon request. Most custom systems wire out the rear panel Input/Output connections to a required connector type that is different from the standard 64 pin male header or 78 pin female D Connectors. This wiring is priced on the basis of labor and materials.

CONTROL MODULES
IF-5 IEEE488/RS232 CONTROL MODULE
This module provides remote control via both RS232 Serial and IEEE488 Talk/Listen interfaces as detailed in Applications Bulletin AP-5.
IF-6 LAN INTERFACE
This optional module allows control over a 10BaseT Ethernet Local Area Network via TCP/IP protocols as described in Applications Bulletin AP-5.

MANUAL CONTROL
MC-2 WITH LCD DISPLAY
This local control supplies a front panel Keypad and LCD Display that lets the operator control any switch and verify switch status.
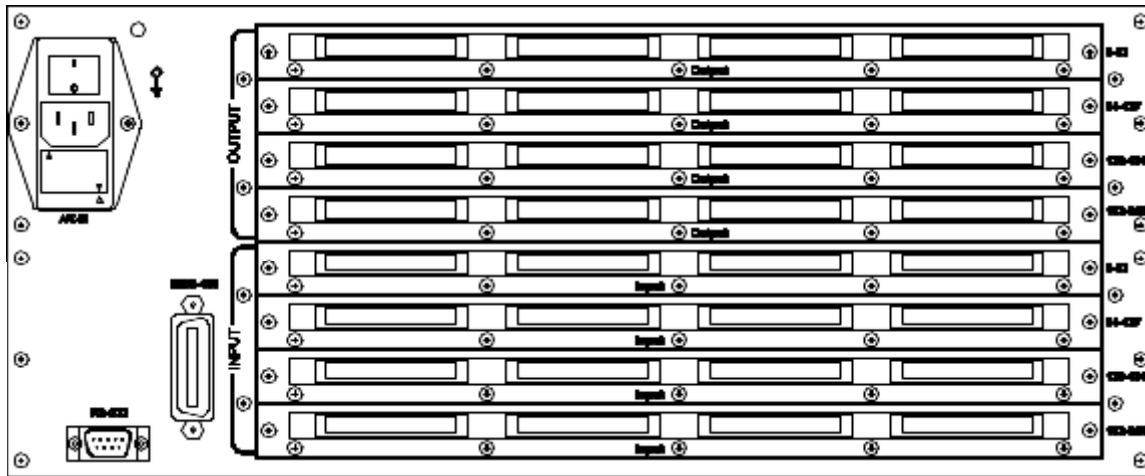### VMCS
This Virtual Manual Control Software allows a remote operator using a PC to view matrix Status and control switches using a full Graphical User Interface.

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FOR TECHNICAL ASSISTANCE

SPECIFICATIONS AND BUFFER OPTIONS

DX/256x256 Mainframe Rear View with IEEE488 and RS232 Control

Fig. 2

DX/256x256 SERIES MATRIX

The DX Series is intended to switch almost any digital stream data stream in a nonblocking (any input to any output without disturbing previously set paths), full fan out (any one input to any or all outputs) configurations. The Basic system is intended to switch TTL or CMOS signal levels.

When used without buffer modules, the system conforms to all TTL/LVTTL specifications below

DX SPECIFICATIONS (signal w/o buffers)

Input Voltage High (VIH) :	2.1V Min	5.25V Max
Input Voltage Low (VIL)	-0.3V Min	0.8V Max
Output Voltage High (VOH)	2.4V Min	3.7V Max
Output Voltage Low (VOL)	---------	0.4V Max
Data Rate	---------	80Mb/s Max
Output Current	---------	80mA Max

CONNECTIONS

Signal Connections:	Standard 68 pin male header or 78 pin female D connec tors. Patch panels can be pro vided to convert 68 pin male header or 78 pin female "D"to BNC, SMA or customer speci fied connector.
AC Input:	Universal, US Standard AC
RS232:	D9 Male
GPIB:	IEEE488
10BaseT LAN:	RJ45
LAN to RS232:	RJ45

GENERAL SPECIFICATIONS

Dimensions - 19" rack mount, 7" (4U) high and 20" deep
Weight - <45 lbs (20.41 Kg)
AC Input -100 to 130 VAC or 200 to 260 VAC, 47/63 Hz,
Operationg Temperature - 0 to 50 ºC
Storage Temperatures - -25 to 65 ºC
Switching Speed - 50 ns + Control Interface Delay
Humidity - 95% RH noncondensing to 30º C

INPUT and OUTPUT BUFFERS

Optional Input and/or output buffer modules convert the system to RS-422 and/or RS-232 levels. Each buffer module has sixty-four (64) channels so a fully buffered 256x256 system has four input buffers and four output buffers. When these modules are used, the specifications of the system are determined by the input and/or output buffers present.

The RS-422 input and output buffer modules have two options for connectors, 68 pin male header or 78 pin female "D" connector.

DX SPECIFICATIONS (signal with buffers)

RS-422 Input Buffer Characteristic:	
Common Mode Input Voltage (Vcm)	-7V<Vcm<+7V
Differential Voltage Swing	200 mV Min
Input Resistance	6.8 KOhm Typical
Data Rate	20 Mb/s Max
RS-422 Output Buffer Characteristic:	
Common Mode Output Voltage	1.8V Typical
Output Voltage High (VOH)	2.5V Min /3.4V Max
Output Voltage Low (VOL)	.3V Typical /.5V Max
Data Rate	20 Mb/s Max
Output Current	150 mA Max
RS-232 Input Buffer Characteristic:	
Input Voltage Range	-25V Min /+25V Max
Input Voltage High (VIH)	2.17V Min
Input Voltage Low (VIL)	1.06V Max
Data Rate	200 kb/s Typical
Input Resistance	5.0k Ohms Typical
RS-232 Output Buffer Characteristic :	
Output Voltage High (VOH)	+5V Min /+8V Max
Output voltage Low (VOL)	-8V Typical /-5V Max
Data Rate	120 kb/s Typical
Output Current	±10mA Typical

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Material or Workmanship for a period of five years

CYTEC CORP.

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FX and FO SERIES
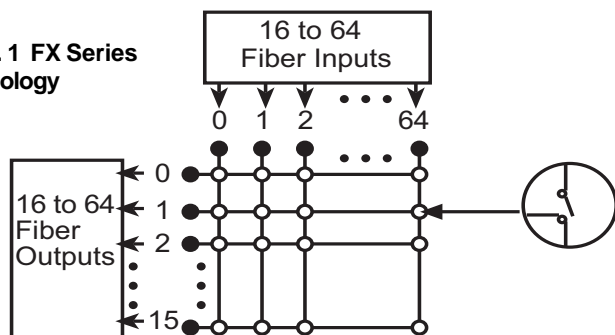## FIBER OPTIC SWITCHING SYSTEMS

CYTEC's FX Series of Fiberoptic Switching Systems are nonblocking, full fan-out optoelectrical switch matrices available in configurations from 8x8 to 64x64. Different Transmitter/Receiver Module combinations provide for 820, 1310 or 1550 nanometer wavelengths, with data rates to 622 Mb (OC-12/STM-4).

The FO Series are passive, optical systems that use mechanical fiberoptic relays. Individual switches, 1xN Multiplexers or NxM Matrices can be supplied. Many connector types and both single and multimode fiber options can be specified. Control options include RS232, IEEE488 and Ethernet LAN. Manual Control is also available.

FX/16x16 and FX/64x64 CHASSIS

At the heart of the FX Chassis is a differential ECL Solid State Matrix routing data at rates up to 1.2 Gbs in both a nonblocking (any input to any output) and full fan-out (one input to many or all outputs) arrangement. The FX/16x16 is used for 8x8 and 16x16 matrices, while the larger FX/64x64 can supply up to 64 individual inputs and outputs. See **Fig 1.** The Chassis also holds, as needed, the Fiberoptic Receiver and Transmitter Modules. The user then specifies the Control Module and optionally a Manual Control. This modularized design allows systems to be configured according to the end user's specific design requirements.

Fig. 1 FX Series Topology

FX/16x16-820-100 Mainframe

STANDARD CONFIGURATIONS

FX/16X16 CHASSIS
Matrices available in 8x8, 8x16, 16x8 or 16x16 configurations. One Input can connect to any, several or all Outputs.

FX/64X64 CHASSIS
Matrices with 16, 32, 48 and 64 Inputs are possible.
Output numbers of 16, 32, 48 and 64 are also possible. Any combination of Inputs and Outputs and be provided, for example a 16x64 or 48x32. One Input can connect to any, several or all Outputs.

CUSTOM CONFIGURATIONS
Custom systems are available upon request. Please contact one of our Applications Engineers for assistance.

OPTOELECTRICAL SWITCHING'S ADVANTAGES:

- It is cost effective.
- One input can be distributed to many or all outputs.
- Modal dispersion is minimized.
- Amplitude restored on weak signals.
- No mechanical mirrors or switches to fail.

TYPICAL APPLICATIONS INCLUDE:

- Programmable Routing in Fiber Wiring Closets.
- Multiport Protocol Analysis for Networks and Test.
- Signal Distribution for Communications and Test.
- Automated Patch Panels.

FX SERIES TRANSMITTER & RECEIVER MODULES

FX/100-820 & -1310-MM MULTIMODE SERIES
These low cost Transmitter and Receiver Modules are designed to switch either 820 nm or 1310 nm signals into multimode 50/125 or 62.5/125 um fiberoptic cables. Data rates up to 155 Mb/sec (NRZ) are handled.

FX/600-1310 & -1550-SM SINGLEMODE SERIES
These Modules are designed to be used with single mode fiberoptic cables. Wavelengths of either 1310 nm or 1550 nm are switched. Data rates of 50 Mb/sec to 700 Mb/sec are handled.

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Figure 2 FX/16x16-600-1310 Mainframe Rear View:
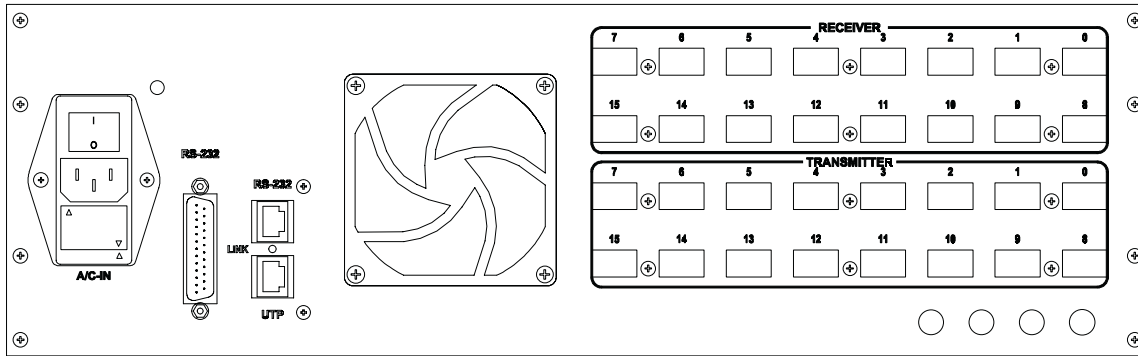
TRANSCEIVER MODULE OPTIONS

FX/100-820-MM and FX/100-1310-MM

Includes the FXR-100-820 Receiver and FXT-100-820 Transmitter Modules for 820 nm wavelengths as well as the FXT-100-1310 Transmitter and FXR/100-1310 Receiver Modules for 1310 nm. Eight individual input or output channels are supplied by each Receiver or Transmitter module. Multimode cables at data rates up to 155 Mb/sec (NRZ) are supported. Transmitters are ALGaAs LEDs, Receivers are PIN Photododes.

SPECIFICATIONS:

	FXT/100-820	FXT/100-1310
Connectors	SMA or ST	ST or SC
Wavelength Range	795 - 860	1270 - 1370
Typical (nm)	820	1310
Glass Fiber Types	50/125	50/125
(Core/Cladding, um)	62.5/125	62.5/125
	100/140	
Data Rates Min.	5 Kb/sec	5 Kb/sec
(NRZ) Max.	155 Mb/sec	155 Mb/sec
FXR Input Power Min.	-20 dBm	-28 dBm
Overload @ Max.	-8 dBm	-11 dBm
FXT Output Power		
Into 62.5/125 um fiber	-15 dBm	-14 dBm
Into 50/125 um fiber	-17 dBm	-17 dBm
Bit Error Rate:	1×10^{-9}	1×10^{-9}

FX/16X16 & FX/64X64 SPECIFICATIONS

Physical	19" Rack Mounting
	Depth 20"
	Height / Weight
	FX/16x16 5.25" (3U) < 25 lbs.
	FX/64x64 Consult Factory
Operating Temp.	0° to 55° C
Storage Temp.	0° to 70° C
Humidity	95% RH non-condensing to 30° C
Connections	Fiber connectors (SMA, ST, SC, FC), AC Mains Power and Remote Control Interface are on rear panel.

FX/600-1310 and FX/600-1550 SERIES

Includes the FXR-600-1310/1550 Receiver and either the FXT-600-1310 or FXT-600-1550 Transmitter Modules. Transmitter and Receiver Modules are each eight channels. Transmitters Modules transmit at the single wavelength of either 1310 nm or 1550 nm and data rates of 50 Mb to 700 Mb/sec (NRZ, nominal) with Laser Diodes (Class 1 Safety Compliant). Receiver Modules support 1100 nm thru 1600 nm.

SPECIFICATIONS:

	FXT/600-1310	FXT/600-1550
Connectors	ST, SC, FC	ST, SC, FC
Wavelength Range	1261 - 1360	1480 - 1580
Typical (nm)	1310	1550
	[short reach]	[long reach]
Glass Fiber Types	Single Mode	Single Mode
Data Rates Min.	50 Mb	50 Mb/sec
Max.	700 Mb/sec	700 Mb/sec
(NRZ, 25 MHz - 350 MHz)		
FXR Input Power Min.	-29 dBm	-29 dBm
Overload @ Max.	-6 dBm	-6dBm
(FXR Input Signal 1100 - 1600 nm)		
FXT Output Power	-11 dBm	-11dBm
(Higher Powers Available)		
Bit Error Rate:	1×10^{-10}	1×10^{-10}

ENVIRONMENTAL

AC Input	Selectable 100-130 or 200-240 Volts AC, 50-60 Hz.
Max. AC Power	100 Watts for FX/16x16 Matrix 400 watts for FX/64x64

PRICING AND AVAILABILITY

Assemble systems by selecting the appropriate FX Chassis, the desired Control Module and input Receiver and output Transmitter Modules as needed.

See Published Price List for current pricing on all FX Products.

Most systems available 30 - 60 days ARO

FO SERIES
PASSIVE FIBER OPTIC SWITCHING SYSTEMS

CYTEC's new FO Series Passive Fiberoptic Switching Systems are computer controlled chassis that are designed to switch standard fiberoptic wavelengths of 850 nm, 1310 nm and 1550 nm. Multimode 62.5/125 um switches are available for 850 nm and 1310 nm wavelengths, while Singlemode 9/125 um switches are available for 1310 nm and 1550 nm. Passive, bidirectional Moving Fiberoptic Switches are used that show insertion losses as low as 0.10 dB for Multimode and 0.25 dB for Singlemode switches. Three configurations are available: Individual Switches, Nx1 Multiplexers and NxM nonblocking (but not full fan-out) Matrices. Control options include RS232, IEEE488 and TCP/IP Ethernet LAN. Manual Control is optionally available.

FO CHASSIS

The FO Series are all 19" rack mounting chassis and are available either as Mainframes or Expansion Chassis. Standard chassis provide from eight to 32 individual switch points. All chassis have front panel LEDs for a visual indication of switch point status. Input and output signal connectors protrude from the chassis rear. FC, SC and ST fiberoptic connectors are standard.

STANDARD CHASSIS

Standard units are built with the required power supplies, a user specified Control Module and optionally a Manual Control. Control Module selections are shown on the last page of this bulletin. The system is completed by specifying the number and type of FO Series Fiberoptic Switches described below.

FO/8, FO/16 & FO/32 CHASSIS

These chassis furnish 8, 16 or 32 individual switch points. One front panel LED is assigned to each switch point and displays status.

CUSTOM CHASSIS

Custom configurations are available on request. As examples, switch modules can be wired out to nonstandard rear panel fiberoptic connectors; switch modules can also be wired together with fiberoptic interconnects to furnish small nonblocking matrices (2x2, 2x4, 4x4, etc.)

FO SERIES PASSIVE SWITCH MODULES

The FO Fiber Optic Switches utilizes a "moving fiber" design concept to achieve highly accurate direct fiber to fiber connections. Currently available in **1x2, dual 1x2 and dual 1x2 nonblocking** configurations. Also available in both **Single** and **Multimode versions** as well as **Normal** and **Low Loss types.** Insertion Loss is as low as 0.25 for Singlemode and 0.10 dB for Multimode switches.
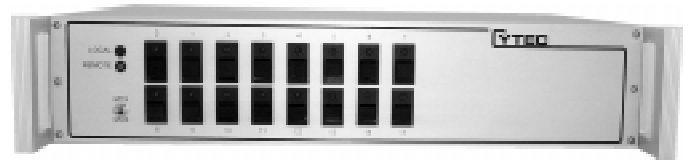
FO/16 with Pushbutton Manual Control

FO SERIES SWITCH SPECIFICATIONS
(Individual Modules without connectors) :

|	
Connectors	ST, SC, FC Standard
	(others available on request)
Wavelength Range	850 nm, 1310 nm Singlemode
(nominal)	1310 nm, 1550 nm Multimode
Glass Fiber Types	9/125 um Singlemode
	62.5/125 um Multimode
Insertion Loss	0.25 dB Singlemode
Low Loss Type, typ.	0.10 dB Multimode
Insertion Loss	0.8 dB Singlemode
Normal Loss Type, typ.	0.6 dB Multimode
Back Reflection	-60 dB Typical
Crosstalk	-70 dB Maximum
Repeatablility	0.01 dB
Switch Time	10 milliseconds Typical
Optical Power	+20 dBm max. Singlemode
	+ 23 dBm max. Multimode

**FO Series
Switch Module**

**FO/1x2
Switch Module**

**FO/2x2
Crossover Module**
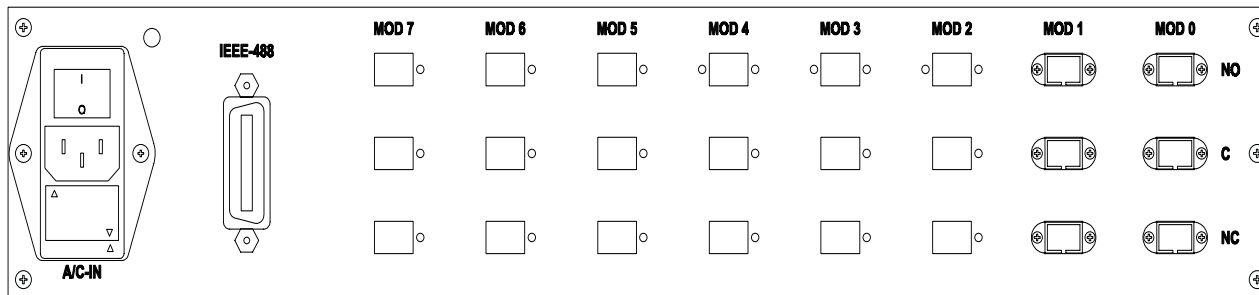
**FO/2(1x2) Blocking
Switch Module**
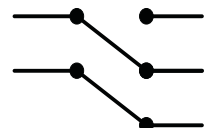
Fig. 4   FO/8 Mainframe with two FO/2x1 Switches Installed

FO SERIES MULTIPLEXERS

Bidirectional Nx1 Multiplexers are assembled from standard FO Chassis by interconnecting Fiberoptic Switch Modules as shown schematically in **Fig. 5**. The interconnects are fiberoptic cables and are usually wired externally, on the rear panel. Internally wired systems may be ordered as an option.
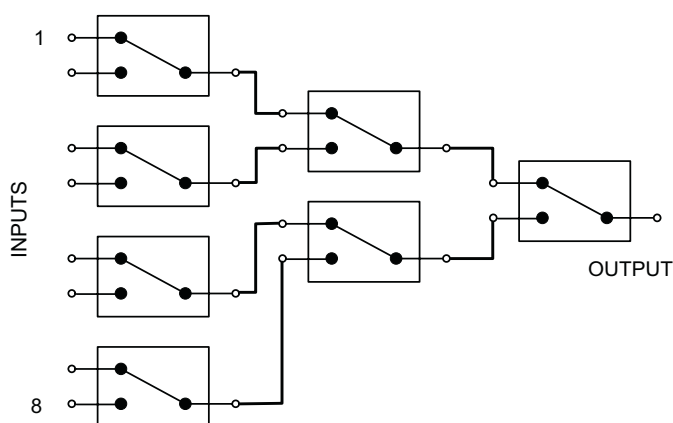

Fig. 5   8x1 Multiplexer using Seven FO/2x1 Switches

FO SERIES MATRICES

Bidirectional NxM Matrices are assembled by interconnecting the required number of individual FO Series fiberoptic switches as shown in **Fig. 6**. The Matrix is non-blocking (but not full fan-out) and any input can connect to any single output. The switches and interconnects are placed inside the chassis, while the input and output fiberoptic connectors are mounted on the rear panel.
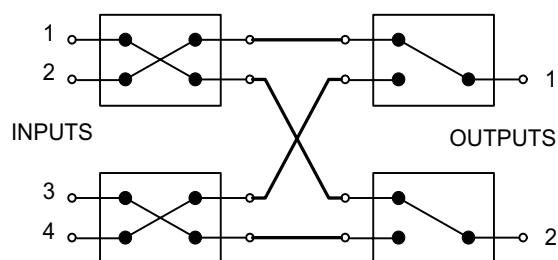

Fig. 6 4x2 Matrix using four two FO/2x1 and two FO/Crossover Switches.

LED DISPLAYS

FO/8, FO/16 and FO/32 Chassis are built with individual, discrete front panel LEDs that show switchpoint status. These LEDs are an invaluable aid in program debugging and system troubleshooting.

CONTROL MODULES

IF-3C RS232 SERIAL
This module has all the RS232 features detailed in Applications Bulletin AP-5.

IF-4C IEEE488 BUS (TALK/LISTEN)
This control module has all the IEEE488 features detailed in Applications Bulletin AP-5

IF-5C IEEE488/RS232 COMBINED CONTROL
This module has both the IEEE488 (Talk/Listen) and the RS232 features detailed in Applications Bulletin AP-5.

IF-6 LAN INTERFACE
This module uses TCP/IP protocols to allow control from an Ethernet LAN as described in Bulletin AP-5.

MANUAL CONTROL

VMCS SOFTWARE
This Virtual Manual Control Software gives the operator the ability to remotely Open and Close switches as well as observe system Status. Control is via a full Graphical User Interface (GUI).

MC/8 & MC/16 PUSHBUTTON
Individual Pushbuttons select and control mainframes holding either eight or 16 individual switchpoints.

MC/32-TW THUMBWHEEL
Mainframe chassis holding 32 switchpoints are built with optional Thumbwheel Manual Controls.

AVAILABILITY

Most systems are available 30 - 45 Days ARO.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Materials and Workmanship for a period of 5 years and that all switches are guaranteed for their rated Operational Lifetime.

SOFTWARE

Example and Driver Programs are available for most common Windows-based programming languages, including LabView, LabWindows and Visual Basic.

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GX SERIES

GROUP SWITCHING MATRICES and MULTIPLEXERS

Standard CYTEC Switch Modules are available that can switch 8, 16 or 32 signal wires simultaneously. These modules can be custom configured as Group Switches to handle large number of signals per switched crosspoint.

GROUP MULTIPLEXERS switch any one of several Groups of Input signals to a single Output Group, or the reverse, that is, one Input Group to one of several Output Groups.

GROUP MATRICES switch selected Groups of Inputs to selected Output Groups in an NxM matrix configuration.
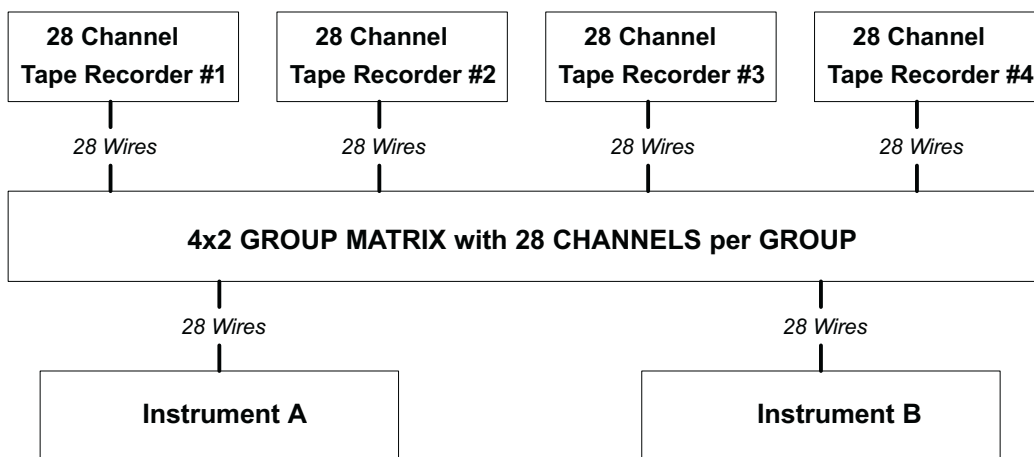
Remote computer control via IEEE488 and RS232 is standard.   Optional computer controls include Parallel TTL, Ethernet LAN and USB. Manual Controls are also optionally available on both the GX Mainframes or the GX Control Units.

The Group Switch concept is best illustrated by a practical application such as the one shown below.

DATA ANALYSIS SYSTEM

Vibration Data collected on four Tape Recorders are to be analyzed by two Instruments. Each Tape Recorder has 28 channels. All 28 channels from any of the four Tape Recorders must be switched as a group to either of the two Instruments as shown below. The data frequency is 0 to 300 kHz, and the wiring is coaxial cable with BNC connectors.

The switch module selected is the **LX8B/4x2**, a four Input to two Output coaxial switch module with BNC Inputs and Outputs. Twenty-eight Modules driven in parallel are needed to switch the 28 coaxial signals in a 4x2 matrix configuration. These modules can be assembled in two **GX/16-E Expansion Chassis** and controlled from one **GX/8 Control Chassis**.

```
┌─────────────────┐  ┌─────────────────┐  ┌─────────────────┐  ┌─────────────────┐
│   28 Channel    │  │   28 Channel    │  │   28 Channel    │  │   28 Channel    │
│ Tape Recorder #1│  │ Tape Recorder #2│  │ Tape Recorder #3│  │ Tape Recorder #4│
└─────────────────┘  └─────────────────┘  └─────────────────┘  └─────────────────┘
      │                    │                    │                    │
   28 Wires             28 Wires             28 Wires             28 Wires
┌──────────────────────────────────────────────────────────────────────────────┐
│              4x2 GROUP MATRIX with 28 CHANNELS per GROUP                        │
└──────────────────────────────────────────────────────────────────────────────┘
           │                                            │
        28 Wires                                     28 Wires
┌─────────────────────┐                    ┌─────────────────────┐
│    Instrument A     │                    │    Instrument B     │
└─────────────────────┘                    └─────────────────────┘
```

The **GX Series** is used when the required number of signals to be switched exceeds that available in Standard Product such as **RS Series** Matrices and Multiplexers, which can switch up to 25 wires per crosspoint and are designed for Data Communications Signals.

For assistance in selecting the best product series and configuration for your application, please contact our Technical Sales Department at the phone number listed below.

CONTACT 1-800-346-3117 OR WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE

GX SERIES CHASSIS

The GX Series Chassis are built as either single chassis Mainframes or as Expansion Chassis controlled by one GX Series Control Unit. For larger systems having more than 16 groups, the MESA Control Unit is used to control several GX/16 Control Units.

GX MAINFRAMES

These single chassis Mainframes are built with their own dedicated power supplies, a Control Module, and have front panel status LEDs. Available Mainframes include the GX/8 controlling 8 groups of signals or the GX/16 controlling 16 groups of signals. The number of Groups being switched by a Mainframe is limited to 16.

GX/8 MAINFRAME

This Mainframe switches up to 8 groups of signals in a 4x2 or 8x1 configuration. Each group is typically made up of one or two Switch Modules.
Example: Using **VX16/G2** Switch Modules with 32 wires per module, each switched group can handle up to 64 wires.

GX/16 MAINFRAME

This Mainframe switches up to 16 groups of signals in a 4x4, 8x2 or 16x1 configuration. Each group typically has one switch module.
Example: Using **VX16/G2** Switch Modules with 32 wires per module, each group can have up to 32 wires.

SWITCH MODULES

The following switch modules can be assembled in GX Chassis to form Group Switches:

CX SERIES are single ended, high frequency coaxial modules built as either 4x1 or 8x1 configurations. Different CX modules have different bandpass specifications and they are built with either with Type A or Type S relays as shown in the **CX Bulletin**.
Example: Switching 8 groups with 8 coaxial signals per group and needing a bandpass of 1 GHz would require eight **CXR/8x1-G Modules**.

LX SERIES are general purpose, low to medium frequency modules. One **LX8/G2 Module** can switch a group of 8 pairs, or 16 single wires, as shown in **Fig.1** of the **LX Bulletin**. The modules are built with Type S, Type M or Type LT relays.
Example: Switching 16 groups with each group consisting of four wire pairs would require eight **LX8/G2 Modules**.

VX SERIES are low to medium frequency switch modules. The **VX16/G2 Module** can switch 16 pairs, or 32 individual wires, and the **VX16/G3** can switch up to 48 wires as shown in the **VX Bulletin**. The modules are built with Type S, Type M or Type LT relays.
Example: Switching 16 groups of 48 wires each would require sixteen **VX16/G3 Modules**.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in workmanship and materials for a period of five years. Reed relays are guaranteed for 100 million operations when used within their published ratings.

GX CONTROL UNITS

One Control Unit drives several Expansion Chassis and is used for configurations requiring more than 16 switch modules. Control Units include a Control Module and the power supplies that are needed to energize a large number of Switch Modules. The following Control Units are available:

GX/8 CONTROL UNIT

This Unit controls up to 8 Groups. Each Group is typically made up of one or two switch modules and handles a large number of signals.
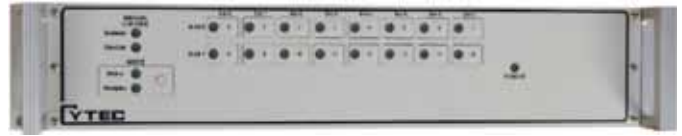
GX/16 Control Unit with Pushbutton Control

GX/16 CONTROL UNIT

This Unit will control up to 16 Groups, with each Group switching a large number of signals.

MESA CONTROL UNIT

When more than 16 signal Groups are required, control is achieved by using a MESA Control Unit, detailed in the **MESA Bulletin**, that drives up to 16 of the **GX/16-E Expansion Chassis** via **GX/16 Control Units**.

GX-E EXPANSION UNITS

These Units are designed for large Group Switches requiring more Switch Modules than can be assembled in one mainframe.
Up to 16 modules can be assembled in each chassis and up to 16 chassis can be controlled from the GX Control Unit, which also supplies power and controls via chassis interconnect cables.
Example: Using **VX16/G3 Switch Modules** with 48 wires per module and two **GX/8-E Expansion Chassis**, each group can switch 96 wires in a 16x1 multiplexer.

RELAY SPECIFICATIONS

	Type S	Type M	Type A	Type LT
Contact Rating VA	10	50	24	10
Switch Voltage V	200	500	24	100
Switch Current A	0.5	1.0	1.0	.25
Carry Current A	1.0	2.0	1.0	1.0
Breakdown Voltage V	400	1000	1000	400
Operating Time ms	1	2	10	1
Life Expectancy cycles	10^8	10^8	10^7	10^8

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HXV SERIES

HIGH VOLTAGE / HIPOT SWITCHING SYSTEMS

The HXV Series of Computer Controlled Switching Systems are used in High Voltage and HIPOT applications. They consist of pre-wired Mainframes and Expansion Chassis which hold selected Switch Modules needed to furnish the required Matrix or Multiplexer configuration.

FEATURES:

- Hot switches up to 3500 volts or 3 amps, carries 5000 volts and 5 amps.
- Computer Control from IEEE488 and RS232; Ethernet LAN or USB are optional.
- Front Panel Display of Switchpoint Status with Status Feedback to the controlling computer.
- Manual Controls optionally available.

HXV/32 Mainframe with PushButton Manual Control

CHASSIS

All HXV Chassis are standard 19" rack mounting width and 15.6" deep. The following chassis are available:

HXV/32 Mainframe -- Holds up to four HXV Switch Modules.
HXV/96 Mainframe -- Holds up to 12 HXV Switch Modules.
HXV/128 Mainframe -- Holds up to 16 HXV Switch Modules
HXV/96-E and HXV/128-E Expansion Chassis -- Used for building larger systems. Up to 16 Expansion Chassis can be controlled from one MESA Control Chassis shown in the **MESA Bulletin**.
Chassis Heights:
HXV/32 = 5.25"   **HXV/96** = 7"   **HXV/128** = 10.5"

SWITCH MODULES

HXV/8x1-A -- Built with eight Form A (SPST) Normally Open Relays arranged as an 8x1 multiplexer.
HXV/8x1-B -- Has eight Form B (SPDT) Normally Closed Relays.
HXV/8-KA -- Provides eight individual Form A Relays.
HXV/8-KB -- Eight individual Form B Relays.
HXV/4x2 -- Has eight Form A Relays arranged as a 4x2 matrix.

CONNECTOR OPTIONS:

SHV - Similar to BNCs. Highest safety.
BP - Banana Plug & Binding Post Type. Lowest Cost.

RELAY SPECIFICATIONS

Contact Rating	200 Watts
Switch Voltage	3500 Volts
Switch Current	3.0 Amps
Carry Current	5.0 Amps
Breakdown Voltage	5000 Volts RMS
Operating Time	3.0 msec
Life Expectancy	100 million operations mechanical

LED DISPLAYS

HXV/32 Mainframes have relay status LED Displays built into the front panels.
HXV/96 and HXV/128 Mainframes and Expansion Chassis require one CL8 Display Module to drive each switch module. CL8 LEDs are visible at the front panel. These display modules must be purchased in addition to the switch modules.

CONTROL MODULES

IF-5 IEEE488/RS232
This Module has both the IEEE488 (Talk/Listen) and the RS232 features detailed in **Applications Bulletin AP-5**.
IF-6 LAN INTERFACE
This Module uses TCP/IP to allow control from a Local Area Network as detailed in **Applications Bulletin AP-5**.
IF-7 EXTERNAL USB/RS232 INTERFACE
This external cable plugs into a USB port on the controlling computer at one end and the Cytec Mainframe's RS232 Port on the other. Allows control via USB at up to 19,200 bps.

MANUAL CONTROL OPTIONS

Pushbutton Manual Controls are optionally available for the HXV/32 Mainframes. (Specify **PB/32**). Optional Keypad LCD Display Manual Controls are offered for the HXV/96 and HXV/128 Mainframes. (Specify **MC-2)**.

SOFTWARE

Example/Driver programs are available free of charge, written in most common application languages, including LabView, LabWindows, Visual Basic and HP Vee.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in workmanship and materials for a period of five years. Reed relays are guaranteed for 100 million operations when used within their published specifications.

CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE

HXV CHASSIS

The HXV Chassis are 19" rack mounting chassis that are pre-wired to hold the HXV Series of Switch Modules. Mainframe chassis include built-in power supplies. The Switch Modules mount so that the signal I/O connectors protrude through the chassis' rear panel. Power and control connectors are also mounted on the rear panel. The front panel has LEDs that show power ON and switch status. Optional manual controls also mount on the front panel. The following units are available:

HXV/32 MAINFRAMES

This Chassis controls 32 switch points. A number of different switching configurations are possible. Add the required Switch Module(s) and a Control Module to complete the system. Standard Chassis depth is 15.6", and Chassis height 5.25". Note that the HXV/32 is not available as an expansion chassis.

HXV/32 Mainframe (rear panel)

HXV/96 and HXV/128 MAINFRAMES

These Chassis control 96 or 128 switch points respectively. A variety of configurations are possible. CL8 Display/Driver Modules drive the associated Switch Modules and provide LED indication of switch status. Add Switch Modules, CL8s and a Control Module to complete the system. Standard Chassis depth is 15.6". The HXV/96 is 7" high, while the HXV/128 is 10.5" high. Purchasing larger Mainframes only partially filled allows for cost-effective future expansion.

HXV/96-E and HXV/128-E EXPANSION CHASSIS

HXV/96 and HXV/128 units are also built as expansion chassis for use with a MESA Control Chassis shown in the **MESA Bulletin**. Multiple expansion chassis allow the configuration of large or complex systems having one point of control, which results in cost savings. Expansion Chassis do not include power supplies or control modules. Add the required switch modules and CL8 Display/Driver Modules as needed to complete the system.

HXV SERIES SWITCH MODULES

The HXV Series of Switch Modules are built with special High Voltage Reed Relays that switch up to 3500 Volts and carry 5000 Volts. Applications include HiPot testing, insulation breakdown testing and other extreme voltage requirements. External signal connectors are either SHV coaxial or Banana Plugs. The modules can be wired together internally to furnish larger configurations while eliminating external connections. For example, chassis can be supplied pre-wired as 32x1, 96x1 or 128x1 multiplexers, or , 16x2, 48x2 or 64x2 matrices.

HXV/8x1-A or -B

This switch module has eight Form A (Normally Open) or Form B (Normally Closed) relays arranged in an 8x1 configuration as shown in **Fig. 1**. A screw terminal connector is built into the module so that the COM connections may be wired together inside the chassis to form larger multiplexers.
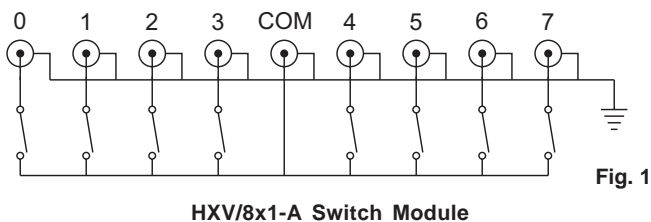
HXV/4x2-A

This switch module is built with eight Form A (SPST) relays arranged in a 4x2 matrix configuration as shown in **Fig. 2**. Built-in screw terminal connectors allow the two COM connections to be wired together among multiple modules within the chassis to form larger matrices such as 8x2, 16x2, etc.
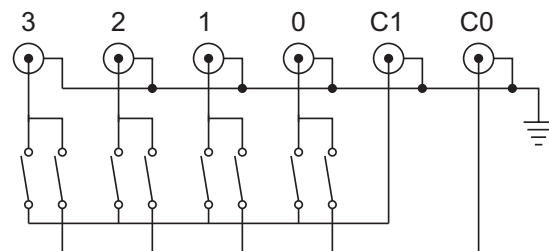
Fig. 1

HXV/8x1-A Switch Module

Fig. 2

HXV/8-KA or -KB

This module has eight individual Form A (Normally Open) or Form B (Normally Closed) relays wired out to 16 connectors as shown in **Fig. 3**. It requires a double slot in the chassis.
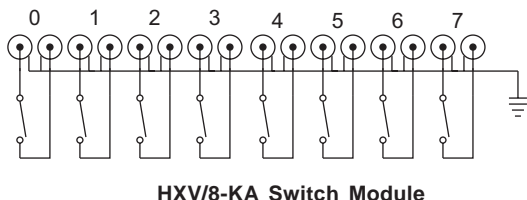
Fig. 3

HXV/8-KA Switch Module

CUSTOM SYSTEMS

CYTEC Corp. takes pride in building custom systems that meet non-standard or special customer specifications. Please call 1-800-346-3117 or email sales@cytec-ate.com to contact an Application Engineer and discuss details.

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   Fax (585) 381-0475

JX SERIES MATRIX/MULTIPLEXERS
FOR
DATA ACQUISITION AND AUTOMATIC TEST

This compact and economically priced Series can be used as either Multiplexers, Matrices or Individual Switches. As Multiplexers, they can be used as a single multiplexer to switch a large number of inputs or outputs to one commpon port , or as a dual multiplexer to switch between either of two common ports. As Matrices, any number of switches can be selected and wired out in the required configuration. Individual Relays are available as SPST or SPDT with standard, mercury wetted or power relays.

Typical applications include:

- **Data Acquisition**

- **Component Testing**

- **Bed of Nails Testers**

- **Cable Testers**

JX/256 Multiplexer with Keypad Manual Control and Display

MAINFRAMES AND EXPANSION CHASSIS

- **Size -** Standard 19" rack mounting chassis, 5.25" high and 16" deep.
- **Prewired Backplane** accepts 16 Switch Modules and one Control Module. The Backplane includes signal bussing so that the Switch Modules can be interconnected up to a 512x1 Multiplexer or 256x2 Matrix.
- **JX/256 Mainframe -** This is a stand alone unit with its own Power Supplies controlled from any one of the Control Modules. It can also be supplied with an optional Manual Control and Front Panel LCD Display.
- **Optional Dual Supplies** - Standard power supplies allow up to 150 relays to be closed simultaneously. Dual supplies can be provided for applications requiring over 150 relays being closed at one time.
- **JX/256-E Expansion Chassis -** These chassis obtain their power and control from the MESA Series Control Units as detailed in the **MESA Bulletin** and any number of Expansion Chassis can be interconnected to make up large multiplexers.
- **JX/256-E-PS Expansion Chassis w/Power Supply -** These Expansion Chassis can be provided with Power Supplies for applications which require closing over 150 relays within the same chassis simultaneously. Call and discuss your application to determine if you need this option.
- **-W Option -** The Mainframes or Expansion Chassis can be supplied with all signals wired out to special, user specified connectors on the rear panel. Consult Factory for pricing.

FEATURES
- **Five Year Warranty**
- **Modular Construction** with expandability by adding Expansion Chassis and Switch Modules.
- **Control Modules** are available for Control from Combined IEEE488 BUS/RS232 Serial Port, 10BaseT Ethernet LAN or 16 BIT TTL Port.
- **Switch Modules** with 1, 2, 3 or 4 pole relays.
    Low voltage switching to 1 microvolt.
    Low current switching to 1 picoamp.
    High current switching to 8 amp.
    Breakdown voltage to 1000 volt.
- **Digital I/O Modules** having 16 TTL or Power Drivers.
- **Multiplex Mode -** The Unit can be operated as a single or dual multiplexer.
- **Matrix Mode -** Any number of Switches can be selected at the same time.
- **Manual Controls -** Switches can be selected by optional front panel keypad with LCD display.
- **Status -** Status feedback to the controller verifies the position of the relays.

SERIES JX16 SWITCH MODULES

The JX16 Switch Modules plug into the JX/256 Mainframe and Expansion Chassis and typically are built with 16 relays and their associated solid state controls, including Status feedback.

The Modules are available with high reliability reed relays that have a guaranteed life of 100 million operations and with the option of either Type S - Standard Dry Reed, Type M - Mercury Wetted Reed or Type LT - Low Thermal Reed. They are also available with Armature type Power Relays for switching up to 2000 VA power or 8 amps current.

There are three basic types of Modules: JX16/L for Multiplexing configurations, JX16/K for discrete relays, and JX16/AB for x2 Matrix configurations.

JX16/L SWITCH MODULES

This Series of Switch Modules has 16 relays configured as Multiplexers as shown in Figs. 1 & 2. These modules can be used as separate muxes or bussed together on the backplane to form one multiplexer as large as 256x1.

Bandpass is 20 MHz (-3dB) and Isolation is less than 60dB at 1 MHz when used in a 256x1 Mux.

JX16/L1 AND /L2 SWITCH MODULES

This module has 16 single or two pole relays as shown in **Fig. 1** with signal inputs wired to a 34 pin header connector. The two 8x1 muxes may be jumpered together to form a 16x1. The outputs are available on a 10 pin header connector or can be jumpered to the card edge connector which plugs into the backplane. It is available with **Type S, M** or **LT** relays.
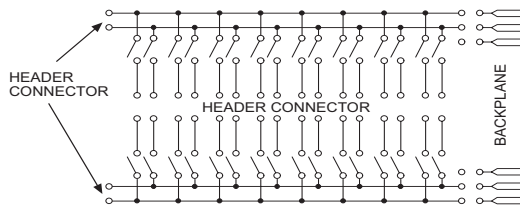
Fig. 1

JX 32/L2 SWITCH MODULE

This module has 32 two pole relays as shown in **Fig. 2** with signal inputs wired to two 34 pin header connectors. The two 16x1 muxes can be jumpered together to form one 32x1 mux. The outputs are available on a 10 pin header connector or can be jumpered to the card edge connector which plugs into the backplane. It is available with **Type A** relays only.
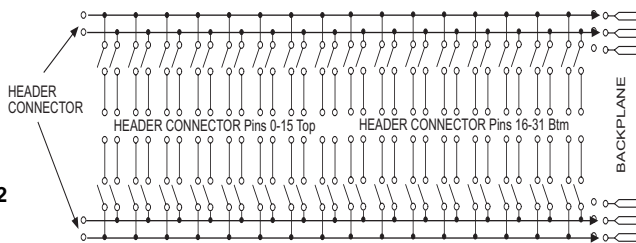
Fig. 2

JX16/4(4x1)-1 and -2 SWITCH MODULES

This module has 16 single or two pole relays arranged as four 4x1 multiplexers as shown in **Fig. 3**. The muxes may be jumpered to the backplane to form up to a 256x1 mux or two 128x1 muxes. It is available with **Type S, M** or **LT** relays.
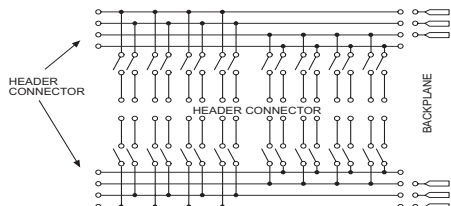
Fig. 3

JX16/K SWITCH MODULES

This Series of Switch Modules has 16 discrete relays with all contacts brought out to connectors accessible from the the chassis rear. Each relay has a Bandpass exceeding 20 MHz (-3dB) and Crosstalk less than 56dB at 1 MHz.

JX16/K1 SWITCH MODULE

This module has 16 single pole relays as shown in **Fig. 4** with both sides of all relays brought out to a 34 pin Header connector. The module is available with **Type S** or **Type M** relays.

JX16/KP SWITCH MODULE

This module has 16 single pole, **Type P** power relays as shown in **Fig. 4** with both sides brought out to a 37 pin D type connector.
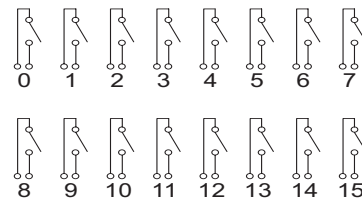
Fig. 4

JX16/KC SWITCH MODULE

This module has 16 single pole, double throw relays as shown in **Fig. 5** with all contacts brought out to a 50 pin Header connector. The module is available with either **Type CS** or Type **CM** relays.

JX16/KCA SWITCH MODULE

This module has 16 single pole, double throw relays as shown in **Fig. 5** with all contacts brought out to a 50 pin Header connector. The module is available with **Type A** relays only.
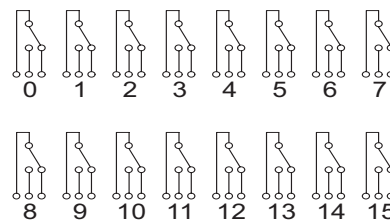
Fig. 5

JX16/KPC SWITCH MODULE

This module has 8 single pole, double throw discrete Form C **Type P** power relays shown in **Fig. 6** with all contacts brought out to screw terminal connectors.
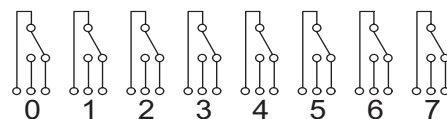
Fig. 6

JX16/AB SWITCH MODULES

These Modules typically have 16 relays configured as an 8x2 Matrix so that any of 8 inputs can be switched to either of 2 outputs. Bandpass is better than 20 MHz (-3dB) and Isolation is less than 40 dB at 100 kHz when used in a JX/256 chassis.

JX16/AB-1 SWITCH MODULE

This Module has sixteen single pole relays arranged in an 8x2 configuration so that any of the eight inputs can be switched to either output A or B as shown in **Fig. 7**. The eight inputs are wired to a 16 pin header connector with two pins wired to each input for convenience in daisy chaining modules. The A and B outputs are available on a 10 pin header connector, or they can be bussed to the backplane as shown in **Fig. 7**. The module is available with **Type S** or **Type M** reed relays.
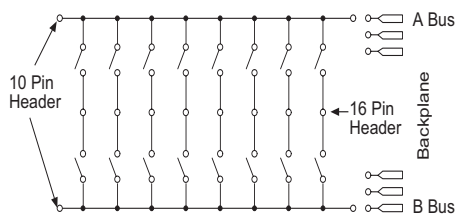
Fig. 7

JX32/AB-1 SWITCH MODULE

This Module has thirty-two single pole relays arranged in a 16x2 configuration so that any of the sixteen inputs can be switched to either output A or B as shown in **Fig. 8**. The sixteen inputs are wired to a 34 pin header connector with two pins assigned to each input for convenience in daisy chaining modules, and two pins are grounds. The A and B outputs are available on a 10 pin header connector, or they can be bussed to the backplane as shown in **Fig. 8**. The module is available with **Type S** or **Type M** reed relays.
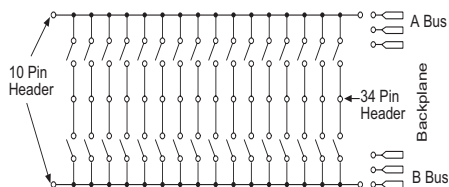
Fig. 8

JX16/AB-4 FOUR POLE MODULE

This Module has 16 four pole relays with signal inputs wired to a 37 pin D type connector as shown in **Fig. 9**. The outputs A and B are wired to the edge connector which plugs into the bussed motherboard. The module is available with **Type S** or **Type M** relays.
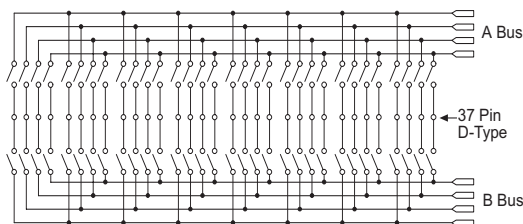**Note: This is the only module without Status Feedback.**

Fig. 9

A/B TYPE MODULE APPLICATIONS

For Cable, Backplane or Bareboard testing, the requirement is to select any two points and check for continuity. It is also necessary to check between one point and all others.

JX16/PROTO-I/O MODULE

This module, shown in **Fig. 10**, plugs into the JX Series backplane and has logic to control 16 TTL Outputs or Relay Driver Outputs and 16 TTL compatible inputs.
TTL Outputs are three state, Non Inverting Buffer/Line Drivers with output capability of 16 LSTTL loads.
Relay Driver Outputs are High Voltage, High Current, Open Collector Drives with diode suppression for energizing Inductive loads.
Data Inputs are Data Selector/Multiplexers with TTL compatible Inputs and three state output to the JX/256 Mainframe. This can be used to interrogate the status of the TTL or Relay Driver Outputs.
Connections may be wired to the 50 pin header supplied on the module or wired directly to the board.
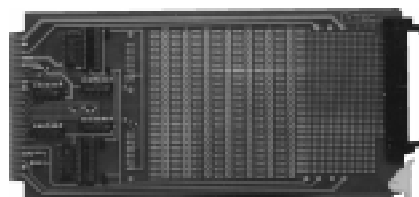
Fig. 10

SWITCH SPECIFICATIONS

The following types of relays are available:
Type S are dry reed switches for Instrumentation Level Signals.
Type LT has a thermal offset of less than 1 microvolt for very low voltage applications.
Type M has mercury wetted contacts with higher power capability.
Type CS and CM are form C versions of Type S & Type M.
Type A are two pole armature

All reed switches have a rated life greater than 100 million operations when used within the following specifications:

	RELAY TYPE				
	S&LT	M	CS	CM	A
Contact Rating	10VA	50VA	3VA	25VA	30VA
Switching Voltage	200V	500V	200V	200V	110V
Switching Current	0.5A	1.0A	0.25A	1.0A	1.0A
Carrying Current	1A	2A	1A	2A	1A
Breakdown Voltage	300V	1000V	200V	1000V	750V
Operate Time	1ms	2ms	1ms	2ms	3ms

Type P and PC Relays are armature relays for high power switching with the following specifications:

AC Rating	2000VA
DC Rating	150 W
Maximum Switch Voltage	380Volt RMS
Breakdown Voltage	1000Volt RMS
Maximum Switch Current	8Amp
Operate Time	10msec

CONTROL MODULES

Plug in modules can control the JX/256 Mainframe from either TTL Port, Combined IEEE488 BUS / RS232 Serial BUS or 10Base-T Ethernet LAN.

The Control Module selects any switch in the Mainframe and Latches or Unlatches the switch in either the Matrix or Multiplexer Mode and can also request the Status of selected switches.

In the Matrix Mode, any number of relays can be selected and Latched or Unlatched.

In the Multiplex Mode, only one relay is selected and Latched. All others are automatically Unlatched.

IF-J1 16 BIT TTL PORT

This Module has 16 TTL compatible lines for Relay Select, Mode Select, Status Switch and Strobe.

IF-J5 COMBINED IEEE488/RS232 MODULE

This Module has both IEEE488 BUS Control with Talk/Listen features and RS232 Serial Control. The Control Functions are detailed in Applications Bulletin AP-5.

IF-6 LAN/RS232 INTERFACE

This module interfaces between the Local Area Network and the RS232 Control Modules using TCP/IP commands as described in Applications Bulletin AP-5.

MANUAL CONTROLS

MC-2 MANUAL CONTROL WITH DISPLAY

This Manual Control Option has a Keypad and LCD Display on the front panel. The operator can select any switch and verify the switch Status via the display.

VMCS

This Virtual Manual Control Software enables a remote operator to view the Status of the Matrix and to Control Switch Selection using a full Graphical User Interface.

SOFTWARE

Visit our website for free software, drivers for common platforms and program expamples.

MATING CONNECTORS

J4C   4 pin connector using individual crimp pins
J8C   8 pin connector using individual crimp pins
J10R 10 pin IDC type ribbon cable connector
J10C 10 pin connector using individual crimp pins
J16R 16 pin IDC type ribbon cable connector
J16C 16 pin connector using individual crimp pins
J20R 20 pin IDC type ribbon cable connector
J20C 20 pin connector using individual crimp pins
J34R 34 pin IDC type ribbon cable connector
J34C 34 pin connector using individual crimp pins
J37R 37 pin D type ribbon cable connector
J37C 37 pin D type crimp pin connector
J50R 50 pin IDC type ribbon cable connector
J50C 50 pin connector using individual crimp pins

APPLICATIONS

SCANNER/MULTIPLEXERS

In this application, the Scanner is required to sequentially select any one of a number of inputs and switch it to a measuring instrument such as a DVM.

For low level signals, or in noisy environments requiring high common mode rejection, it is advisable to use two pole relays switching both the Hi and Lo input of the DVM as shown in **Fig. 11**.
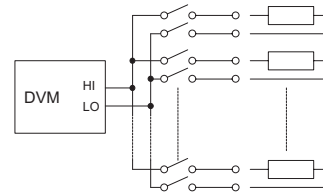
Fig. 11

For extremely low level signals such as thermocouples, the LT type relays with less than 1 microvolt of thermal offset should be used. For additional noise prevention, the shields from the pairs of wires can be switched to the Instrument Guard as shown in **Fig. 12**.
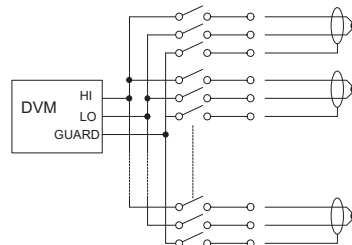
Fig. 12

KELVIN BRIDGE MEASUREMENTS

For very low impedance measurements using a four wire bridge, it is necessary to switch both Stimuli and Sense lines to each side of the device under test as shown in **Fig. 12**. This requires a total of 4 poles switching with two pole relays as shown in **Fig. 13**. Any two points can be selected, and the impedance between these points measured.
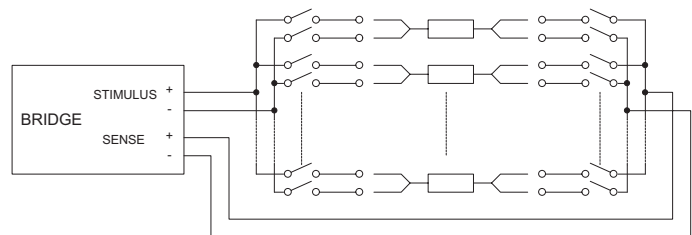
Fig. 13

WARRANTY

CYTEC Corp. warrants that all products are free from defects in workmanship and materials for a period of 5 years. Reed relays are guaranteed for 100 million operations when used within their published specifications.

CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE

YTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   Fax (585) 381-0475

LX SERIES
GENERAL PURPOSE SWITCHING MATRICES
FOR AUTOMATIC TEST, INSTRUMENTATION AND CONTROL

The LX Series are high reliability, low cost, versatile Switching Systems. A modular design concept is used. Interchangeable Control Modules, Switch Modules and Display Modules can be assembled into Matrices, Multiplexers or Individual Switch Point configurations. All chassis have full front panel LED displays. Status Feedback from all switches is provided. A variety of switch modules are offered, including those designed to handle the following signals: Coaxial RF, Low Level with a DC offset less than 1 microvolt, High Voltages up to 1500 volts, and High Current up to 8 amps.

The Control Modules available are IEEE488 Bus, RS232 Serial, TTL Parallel Port, 10Base-T Ethernet LAN, and Universal Serial Bus. Manual Controls are optionally available.

IEEE 488 BUS
RS232 SERIAL
PC I/O PORT
LAN
USB

LX/128 Mainframe with Thumbwheel Manual Control
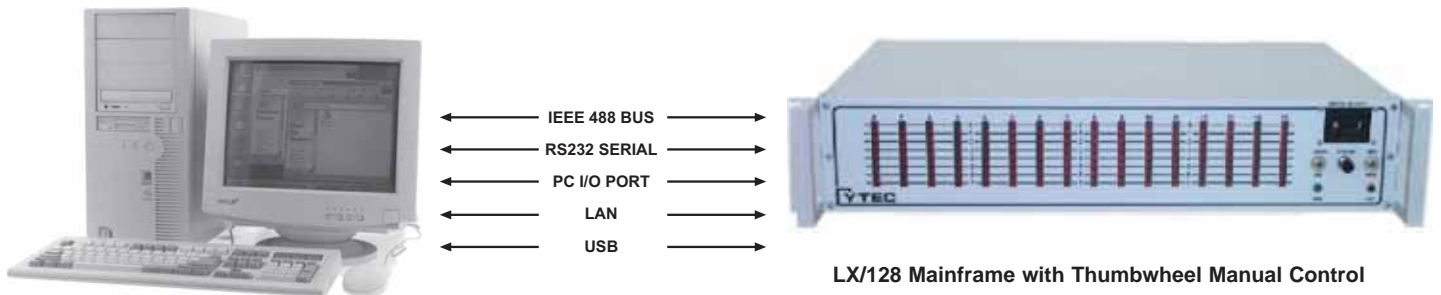
LX MAINFRAMES

The LX Series Mainframes are 19" rack mounting chassis, 3.5" high and 15.6" deep, with power supplies and motherboards that hold up to 16 Switch and Display Modules and one Control Module. Signal connectors are located at the unit's rear panel and LED display is visible through the front panel.
The following Mainframes are standard:

LXA GENERAL PURPOSE

These are the most versatile units, accepting any of the LX Series Switch Modules and capable of furnishing Multiplexers, Matrices or Individual Switches as needed.

LXB MATRICES

These mainframes hold the LXB Series Switch Modules and furnish several prewired Matrix configurations.

LX EXPANSION CHASSIS

These units have the same motherboards as the mainframes but do not have built-in power supplies or control modules. They are powered and controlled from a single MESA Control Mainframe as described in the **MESA Bulletin.** Larger configurations can be created from up to 16 Expansion Chassis, and different product series can be combined to supply a complete system for switching a variety of signals.

LX-W WIRED UNITS

All Mainframes and Expansion Chassis can be supplied in 15.6" deep chassis with modules wired out to user specified connectors. Please contact our Applications Engineers for more information.

SWITCH MODULES

There are two basic switch module series: The **LX8 Series** and **LXB Series**. All modules have signal connectors accessed at the chassis rear panel.

LX8 SERIES

These modules are used in the LXA Mainframes and include the following:

LX8/G2 Switch Modules are built with 8, two pole relays and have signal inputs and outputs arranged so that they can be wired to supply several matrix configurations.

LX8/G1P Switch Modules are built with 8, single pole Type P Power Relays. These are designed for high power and current applications and have signal connectors that can be wired to provide several matrix configurations.

LX8/K Switch Modules have 8, Normally Open single pole relays with inputs and outputs wired to a signal connector.

LX8/OD Driver Modules have 8, optoisolated Output Drivers and are used to drive external logic or electrical loads.

LX8/ID Input Detection Modules have 8, optoisolated Input Detectors that are capable of sensing DC or AC voltage levels.

LXB SERIES

These Switch Modules are used in the LXB Matrices and include the following:

LXB/2(1x4) Switch Modules have 8, single or double pole relays arranged as two 1x4 matrices.

LXB/4(1x2) Switch Modules have 8, single or double pole relays arranged as four 1x2 matrices.

LXB/(1x8) Switch Modules have 8, single or double pole relays arranged as one 1x8 matrix.

LXA GENERAL PURPOSE SERIES

The LXA Series are 19" rack mounting Mainframes or Expansion Chassis, 3.5" high, with motherboards that hold any of the LX Series of Switch Modules, Latching/Display Modules and a Control Module.

LXA/128 MAINFRAME

This chassis is 15.6" deep. It is built with power supplies and motherboards that hold a Control Module, up to 16 LX8 Switch Modules and 16 CL8 Latching/Display Modules. The Signal Motherboard busses the switch modules together (shown in **Fig. 1)** to furnish a number of different Matrix configurations.

LXA/128-E EXPANSION CHASSIS

These chassis are 15.6" deep and hold the same motherboards as the Mainframe but without power supplies or a Control Module. Each Expansion Chassis is powered and controlled via a MESA Control Mainframe as shown in the **MESA Bulletin.**

LXA/128-W WIRED CHASSIS

Mainframes and Expansion Units can be supplied in 15.6" deep chassis with signal inputs and outputs wired to user specified connectors on the rear panel.
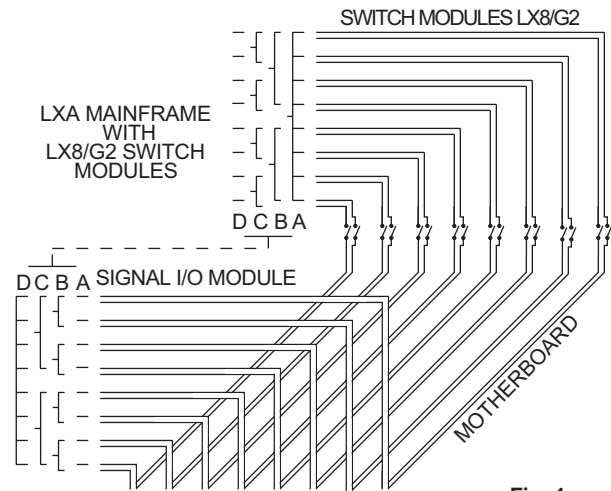

Fig. 1

LXA SWITCH MODULES

These Switch Modules plug into the LXA Motherboard and have signal connectors that are accessed from the chassis rear. The CL8 Latching/Display Modules mate with and drive the relays on the Switch Modules and have LEDs that are visible through the chassis front panel. The following modules can be assembled in any LXA chassis.
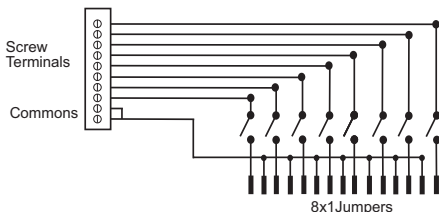
LX8/G2 SWITCH MODULES

Each module has 8, two pole relays. One side of each relay wires to the module's rear panel connector, and the other side wires to a card edge connector which plugs into the Signal Motherboard. The motherboard busses together the Switch Modules and a Signal I/O Module as shown in Fig. 1. Energizing a relay connects the path between the Switch Module and the Signal I/O.
Switch Module and Signal I/O Module connectors can be wired to furnish the following different configurations:
A - Each module is a 1x8 and 16 modules create a 16x8 matrix.
B - Each module is a 2x4 and 16 modules create a 32x4 matrix.
C - Each module is a 4x2 and 16 modules create a 64x2 matrix.
D - Each module is an 8x1 and 16 modules create a 128x1 mux.
LX8/G2-R is built with a 20 pin IDC header signal connector with J20R or J20C mates. The switch module is available with Type S Standard, M Mercury or LT Low Thermal reed relays**.**
LX8/G2-E has a card edge connector with J20 mates and is recommended for higher voltages when using Type M Mercury or Type HV High Voltage reed relays.

LX8/G1P-ST POWER SWITCH MODULE

This module is built with 8, Type P Power relays and Screw Terminal signal connectors. It differs from the other LX8/G Switch Modules in that single pole, high power switching is provided. This module can also be used as an individual 8x1 multiplexer. Two pole relay versions of this module are available.

LX8/K SWITCH MODULES

These modules have 8 individual Form A (SPST) single pole relays. The two sides of the relays wire out to the signal connector located at the chassis rear as shown in Fig. 2.
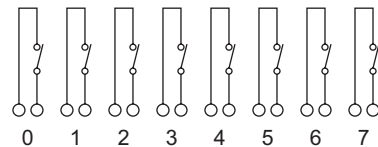
Fig. 2

Three LX8/K Modules are offered:
The **LX8/K-E** is built with a 20 pin card edge connector with J20 mates. It is available with Type S, HV or M reed relays.
The **LX8/K-R** has an IDC header connector and is available with Type S, M or A relays.
The **LX8/KP** is built with screw terminal connectors and Type P relays that are capable of switching high power and current. Mating connectors are included in the price of this module.

LX8/OD OUTPUT DRIVER MODULE

These modules have 8 individual optoisolated Solid State Output Drivers with 16 Pin Screw Terminal connectors. Mating connectors are included in the price of these modules.
LX8/OD-TTL Outputs TTL level signals of 100 mA at 5 VDC.
LX8/OD-MP is a medium power driver with up to 1 amp drive at 24 VDC.
LX8/OD-HP is a high power driver outputting 1 amp at 48 VDC.

LX8/ID INPUT DETECTION MODULE

This module is used to detect voltage levels in either DC or AC circuits. The module supplies eight separate, optoisolated two wire inputs and has 20 pin header connectors with J20R or J20C mates. This module does not require a CL8 Display Module as it has its own LEDs that show Input States (e.g. detected signals above threshold level).

LXB MATRIX SERIES

The LXB Series units are two pole switch matrices and are available as either Mainframes or Expansion Chassis. They are well suited for use in two wire data communications applications, including T1 and ISDN, where wiring is minimized and performance is optimized. The following matrix configurations are available: Two separate 16x4's in one chassis, one 16x8, one 32x4 or one 64x2. Signals connectors include BNCs, Screw Terminals or Three Pin Headers. Twin BNCs are available at extra cost.

MAINFRAMES

There are two basic Mainframes: The LXB/2(16x4) and the LXB/64x2. Both are 19" rack mounting chassis, 3.5" high and 15.6" deep. Each mainframe is built with power supplies and motherboards that hold up to 16 Switch Modules, 16 Latching/Display Modules and a Control Module. Manual Controls are optional.

LXB/2(16x4) MAINFRAME

This mainframe accepts up to 16 LXB/2(1x4) Switch Modules to form two separate 16x4 Matrices as shown in **Fig. 3.** Jumpering Inputs A & B on the Switch Modules forms a 16x8 Matrix. Motherboard jumpers can also be added to bus Outputs 1 & 5, 2 & 6, 3 & 7 and 4 & 8 to connect the two 16x4 Matrices to create a single 32x4 Matrix.
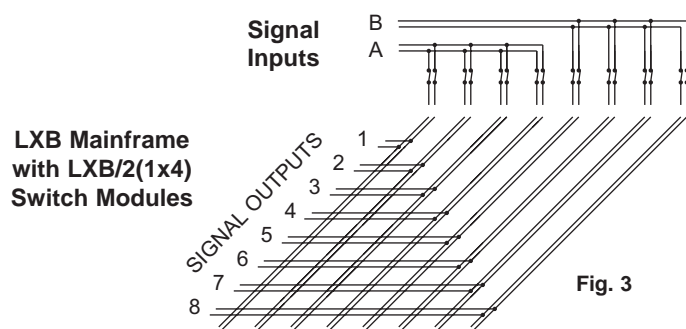**Bandpass** is 40 MHz at -3dB and **Crosstalk** is less than -60dB at 10 MHz.

LXB/64x2 MAINFRAME

This mainframe accepts up to 16 LXB/4(1x2) Switch Modules and one Signal I/O Module. The Signal I/O Module interconnects the Signal Motherboard bus traces to form a 64x2 Matrix as shown in **Fig. 4**.
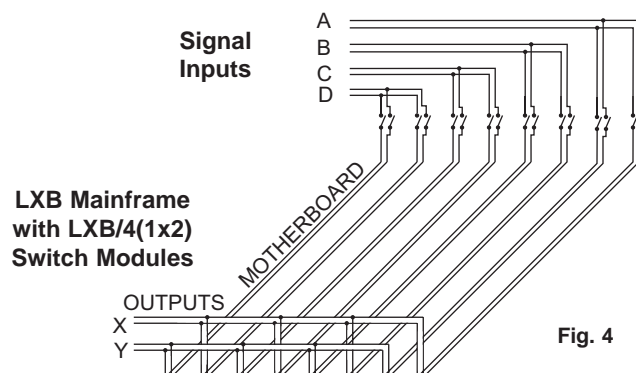**Bandpass** is 15 MHz and **Crosstalk** is less than -60dB at 10 MHz.

Fig. 3

Fig. 4

LXB/2(16x4)-E EXPANSION CHASSIS

This unit has the same motherboards as the Mainframe without power supplies, and is controlled from a MESA Unit as described in the **MESA Bulletin**.

LXB/64x2-E EXPANSION CHASSIS

This unit has the same motherboards as the Mainframe without power supplies, and is controlled from a MESA Unit as described in the **MESA Bulletin**.

LXB SWITCH MODULES

LXB/2(1x4) SWITCH MODULE

This module has 8, single or double pole relays arranged as two separate 1x4 matrices as shown on **Fig. 3.** It plugs into the LXB Signal Motherboard. The two matrices, A & B, can be jumpered on the module to create one 1x8 matrix.
This module is available with Type S Standard, Type M Mercury, Type LT Low Thermal and Type HV High Voltage relays. The following connectors are available: Type E- 20 pin card edge, Type N - BNC receptacles, Type H - Three Pin Headers or Type ST - Screw Terminals. Twin BNCs are available at extra cost.

LXB/2(1x4)-2P-ST SWITCH MODULE

This module is similar to the above, except it is built with 8, two pole Type P Power Relays and Screw Terminal connectors. It is used for higher power or current applications where a matrix configuration is required. Mating connectors are included in the price of the module.

LXB/4(1x2) SWITCH MODULE

This module has 8, single or double pole relays arranged as four 1x2 matrices as shown in **Fig. 4**.
The module is available with Type S, Type M or Type LT relays.
The following connectors are available: Type N - BNCs, Type H - Three Pin Headers or Type ST - Screw Terminals. Twin BNCs are available at extra cost.

LXB/(1x8) SWITCH MODULE

This module has 8, single or double pole relays arranged as one 1x8 matrix.
The module is available with Type S, Type M or Type HV relays and Type E - 20 pin card edge connectors.

CL8 LATCHING/DISPLAY MODULE

The CL8 Latching/Display Modules drive the selected relay and have individual LEDS that show every switchpoint state (open or closed).

GX GROUP SWITCH

LX8/G2 Switch Modules can be used in either the GX/8 or GX/16 Group Switch Chassis to switch signals in groups of 16 wires in up to a 16x1 Multiplexer configuration. For more information see the GX Bulletin.

LX SERIES SWITCH SPECIFICATIONS

These Switch Modules are built with several different relay types, as determined by the switched signals.

Type S Standard reed relay is used for general purpose instrumentation level signals.

Type M Mercury reed relay switches higher power signals.

Type LT Low Thermal reed relay has a thermal offset of less than 1 microvolt and is used for for very low level signal applications.

Type HV High Voltage reed relay is rated at 1500 volts breakdown voltage.

Type P High Power armature relay has an AC rating of 2000 VA and can switch up to 8 amps.

Type S, **Type M**, **Type LT**, and **Type HV** are all high reliability reed relays with a guaranteed life of 100 million operations when used within the following specifications. **Type P** relays are armature type and have a mechanical life of 10 million cycles.

SPECIFICATIONS	S	M	LT	HV	P
Contact Rating VA	10	50	10	10	150
Switching Voltage	200	500	200	1000	500
Switching Current	.05VA	1.0A	.05A	0.1A	8A
Carrying Current	1.0A	2.0A	1.5A	1.0A	10A
Breakdown Voltage	400	1000	400	1500	1400
Operate Time msec	1	2	1	1	10
Rated Operations	10^8	10^8	10^8	10^8	10^7

OVERALL SPECIFICATIONS

DIMENSIONS - Standard Mainframes are 19 inch Rack Mounting, 3.5 inches high and 15.6 inches deep. Wired Mainframes are 15.6 inches deep.

WEIGHT - Maximum weight,with a full complement of Modules, is less than 25 lbs.

POWER - 100 watts at 100-130 Volts AC or 200-260 Volts AC.

ENVIRONMENT - Operating 0^0 C to 50^0 C @95% Relative Humidity

Storage -25^0 C to 65^0 C @95% Relative Humidity

SOFTWARE

Drivers and Sample Programs are available for the most common programming languages. These check the entire system by cycling through all switches, sequentially latching and unlatching each switch while checking Status.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Material or Workmanship for a period of 5 years, and that all switches are guaranteed for their Rated Operations.

LX CONTROL MODULES

The LX Mainframes can be computer controlled via the modules listed below. Each Control Module selects any Switchpoint and Latches, Unlatches and returns Status of that point.

IF-1 PARALLEL PORT

This module requires 14 individual TTL level binary lines from the controlling computer. These select Switch and Mode, Strobe the selected command and return SwitchPoint Status.

IF-5 IEEE488/RS232

This module combines both the IEEE488 Talk/Listen and the RS232 features detailed in the **AP-5 Bulletin**.

IF-6 LAN INTERFACE

This module allows control via a 10Base-T Ethernet LAN using TCP/IP protocol detailed in the **AP-5 Bulletin**.

IF-7 COMBINED USB/RS232

This module furnishes computer control via either RS232 or Universal Serial Bus. It allows users to switch to USB control as COM ports are obsoleted on new computers.

MANUAL CONTROLS

MC/128-TW MANUAL CONTROLS

Front panel thumbwheels and push button Manual Controls select and control all Mainframe Switchpoints. This manual control can be "locked out" by the computer.

VMCS VIRTUAL MANUAL CONTROL SOFTWARE

This Software displays a full Graphical User Interface (GUI) on the controlling computer. The operator controls the Mainframe with simple mouse point-and-click operations. The software can also be used to control the unit over a LAN.

A demo version is available on our web site at:
http://www.cytec-ate.com/soft.htm

PALM PC MANUAL CONTROL

This is currently available for use with the IF-5 IEEE488/RS232 Control Module. Application Programs running on the Palm PC display a virtual keypad manual control.

ACCESSORIES

MATING CONNECTORS

J3	Three Pin Header Connector
J10	Ten Pin Card Edge Connector
J20	Twenty Pin Card Edge Connector
J20R	Twenty Pin Ribbon Connector
J20C	Twenty Crimp Pin Connector

CABLES

CBL-0.5	IEEE488 Cable .5 Meters long
CBL-1	IEEE488 Cable 1 Meter long
CBL-2	IEEE488 Cable 2 Meters long
RS-1	RS232 Cable 1 Meter long
PC-2	PC Interface Cable 2 Meters long

CHASSIS SLIDES

CHS-1　Chassis Slides with 15 inches travel

CONTACT 1-800-346-3117 OR WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE

YTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   FAX (585) 381-0475

PC-B/PCI SERIES MODULES

The PC-B Series Modules plug into PC/AT/XT Compatible ISA Bus slots. The PCI Modules plug into PCI slots. Both are available as either Switch Modules or Driver Modules. The modules can be controlled either by direct hardware port access or by installable Device Drivers. PCI Moduldes come with Plug and Play device drivers. Software support is available for the most common program languages.

The modules also have a special Status feedback feature which enables the computer to confirm that the correct selections have been made by checking the relay drive. This can be used to self test the modules or as a diagnostic tool.

INTERFACE MODULE

SWITCH MODULE

PC-B SERIES SWITCH MODULES

Each Module has 16 high reliability reed relays with operate times less than 2 msec and guaranteed for 100 million operations. Relay options offered are Standard Dry Reed, Mercury Reeds for high current and Low Offset Reeds for microvolt signal levels.

The Signal Input connector in each module is a 37 pin male D type connector and mates are available for Ribbon Cable wiring or for individual Crimp Pin wiring. External screw terminal blocks are optionally available.

All modules have Status feedback and LEDs associated with each relay for visual indication of the relays energized.

Power Requirement $\pm$5 volt < 0.2 Amp $\pm$12 volt < 20 mas per relay energized.

PC-B/MUX 16 SWITCH MODULE

This module has 16 two pole relays as shown in Fig. 1 with selection of any one of 16 inputs to one output and Break before Make Switching. Only one relay may be selected at any time.

Bandpass -- With 50 ohm terminations, the bandpass is flat to within 1 dB from DC to 10 MHz and is within 3 dB up to 70 MHz.

Isolation between Inputs to Outputs across unused channels with 50 ohm terminations is as follows:

10 kHz - 90 dB   100 kHz - 70 dB   1 MHz - 50 dB

Relays can be supplied with Type S, Type M, Type MG, or Type LT contacts. Type M versions must be operated in a vertical position.
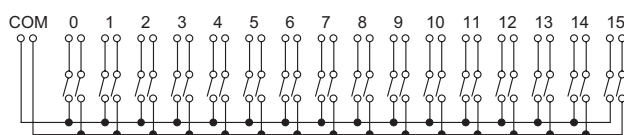
PC-B/K16 SWITCH MODULE

This module has 16 single pole discrete Form A relays as shown in Fig. 2. Any number of the relays may be latched simultaneously. Relays may be wired externally in any required configuration.

Bandpass -- With 50 terminations, the bandpass is from DC to 30 MHz.

Isolation -- With 50 terminations, the isolation between channels is as follows:

10 kHz - 90 dB   100 kHz - 70 dB   1 MHz - 50 dB

Relays can be supplied with Type S, Type M Relays or Type MG contacts. Type M versions must be operated in a vertical position.

COM 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Fig. 1

0   1   2   3   4   5   6   7   8   9 10 11 12 13 14 15
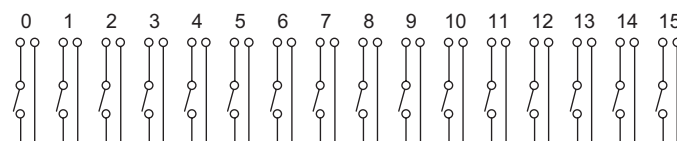
Fig. 2

PC-B/2(8x1) SWITCH MODULE

The PC-B/2 (8x1) Switch Module is a general purpose module which can be used in either Matrix or Multiplexer applications. It has 16 two pole relays configured as two separate 8x1 two wire Multiplexers as shown in Fig. 3 which can be jumpered as one 16x1 two wire Multiplexer.

Fig. 3

PC-B/30x1 SWITCH MODULE

By using one Form C relay to submultiplex the 16x1 mux, the module can be used as a 30x1 single pole Mux as shown in **Fig. 4.**

Fig. 4

Bandpass
With 50 ohm terminations, the bandpass is from DC to 30 MHz.
Isolation
With 50 ohm terminations, the isolation between channels is:
10 kHz - 90 dB   100 kHz - 70 dB   1 MHz - 50 dB
Relays can be supplied with Type S, Type M or Type LT contacts. Type M versions must be operated in a vertical position.
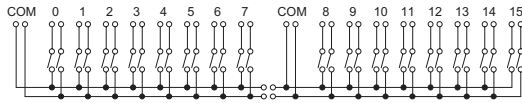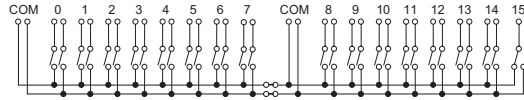
RELAY SPECIFICATIONS

Type S - Standard relays for Instrumentation Level Signals.
Type M - Mercury relays for high current switching.
Type MG - Mercury Amalgam Non-Position Sensitive Relays.
Type LT - Low Thermal relays with less than 1 microvolt offset.
Switches are guaranteed for 100,000 operations if used within the following specifications:

	Type S & LT	Type M	Type MG
Contact Rating	10 VA	50 VA	30 VA
Switching Voltage	200 V	500 V	350 V
Switching Current	0.5 A	1.0 A	0.75 A
Breakdown Voltage	300 V	1000 V	1000 V
Carry Current	1.0 A	2.0 A	2.0 A
Operate Time	<1Ms	<2Ms	<2Ms

PCI BUS INTERNAL PC MODULES
## PCI/32DRV DRIVER MODULE

32 channel plug and play relay driver module allows control of up to 32 relays, solenoids or other loads. Open collector darlington current sinks or sources deliver up to .35 amps of current per channel with a max of .5 amps per group of 8 drives. Uses +12 volts from computer or up to 50 volt external source.

PCI/2(8X1)-2S SWITCH MODULE

This Module is functionally equivalent to the PC-B/2(8x1) Module but plugs into the PCI Bus and uses Armature (Type A) relays.
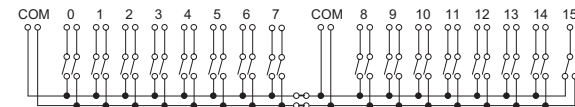Plug and Play switch module has two separate 8x1 two pole multiplexers which may be jumpered to form one 16x1 two pole mux as shown in **Fig. 5**.

Fig. 5
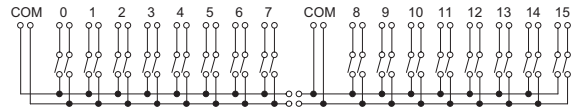
A submultiplexer relay may be used to provide a 30x1 single wire mux as shown in **Fig. 6**.

Fig. 6

RELAY SPECIFICATIONS

	Type A
Contact Rating VA	30
Switching Voltage DC	110V
Switching Current DC	1.0A
Carrying Current DC	1.0A
Breakdown Voltage DC	750V
Operate Time MSec	3

PC-B DRIVER MODULES

There are two basic types of Modules: the PC-B/24 Relay Driver Module, and the IF-PC TTL Compatible Input/Output Module. Both Modules are half slot size and have 37 pin female D type connectors. Mates are available for ribbon cable or crimp pin type wiring.

PC-B/24 DRIVER MODULE

This Module has 24 separate relay drivers which can be used to select and control CYTEC Switch Modules or any other types of relays.
The 24 Relay drivers are in three groups of eight high voltage, high current Darlingtons with open collector outputs and integral suppression diodes. **Any number of these drivers can be selected at any time and the Status of the drivers selected can be verified by the computer**.
Each driver can operate on different voltages up to a maximum of 50 volts and current up to 500 mas, with a maximum of 1500 mas within any group of 8 drivers.

ENVIRONMENT
Operating Temperature: 0º to 55º C.
Storage Temperature: - 20º to 70º C.
Humidity: Less than 95% RH, no condensation to 30º C.

IF-PC MODULE

This is a half slot size module and has TTL compatible outputs and inputs suitable for selecting up to 8,192 relays and checking Status of the relays in any of the CYTEC Series of Switch Matrices.
The relays can be Latched or Unlatched in the Matrix or Multiplex Mode, or an entire matrix can be cleared. Status of all relays can be verified and displayed on the Computer Monitor. Power requirements are dependent on the system size and can be supplied with the Matrix chassis.

FOR TECHNICAL ASSISTANCE, CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   Fax (585) 381-0475

PX/512 SWITCH MATRIX

The PX/512 Series of Switching Matrices are compact and economically priced units using high reliability Reed Relay Modules assembled into pre-wired Mainframes or Expansion Chassis to assemble a 32x16 Matrix, two 32x8 Matrices or a 64x8 Matrix with either single or two pole signal switching. Computer Control can be from IEEE488 BUS, RS232 Serial or 10Base-T LAN.

SPECIAL FEATURES:

- **Matrix layout for high bandpass of 20 MHz and crosstalk less than -40 dB at 10 MHz.**
- **Status Feedback to the computer from the relay coil drive gives positive assurance that selected relay is energized.**
- **Interrogation Mode gives readout of all switched paths in terms of inputs and outputs connected.**
- **Optional Manual Control with visual display of selected switch path.**
- **Optional nonvolatile Ram for storage of preset or power-up configuration.**
- **VMCS Virtual Manual Control Software for Remote operation using a full Graphical User Interface.**

SWITCH MATRIX UNITS

The units are all 19" rack mounted Chassis, 3.5" high, pre-wired to accept up to 16 of the PX/32 Switch Modules and a Control Module. Signal inputs and outputs are available with either coaxial BNC receptacles (-N), Header type connectors (-H) or screw terminals (-S).

MAINFRAMES

These are stand alone pre-wired chassis with low noise power supplies and motherboards to accept 16 Switch Modules and a Control Module.
There are two basic series of Mainframes:

PX/512-1 MAINFRAMES

These are 16" deep chassis pre-wired for single pole switching matrices.
PX/512-1A has a pre-wired motherboard accepting 16 of the PX/2x16-1 Switch Modules in a 32x16 Switch matrix configuration.
PX/512-1B has a pre-wired motherboard accepting 16 of the PX/2(2x8)-1 Switch Modules in two separate 32x8 matrices which can be combined as one 64x8 matrix.

PX/512-2 MAINFRAMES

These are 21" deep chassis pre-wired for two pole switching matrices.
PX/512-2A has pre-wired motherboards accepting 16 of the PX/2x16-2 Switch Modules in a 32x16 matrix configuration.
PX/512-2B has pre-wired motherboards accepting 16 of the PX/2(2x8)-2 Switch Modules in two separate 32x8 matrices which can be combined as one 64x8 matrix.

EXPANSION CHASSIS

These units are pre-wired to accept 16 Switch Modules and an Expansion Interface Module so that several chassis can be controlled and receive power from one MESA Control Unit as shown in the MESA Bulletin.
These Expansion Chassis are available in the same matrix configurations as the Mainframes.

PX/512-E-1 EXPANSION CHASSIS

These are 16" deep chassis accepting single pole switch modules.
PX/512-E-1A has a 32x16 matrix configuration.
PX/512-E-1B has two 32x8 matrices which can be combined as one 64x8 matrix.

PX/512-E-2 EXPANSION CHASSIS

These are 21" deep chassis accepting two pole switch modules.
PX/512-E-2A has a 32x16 matrix configuration.
PX/512-E-2B has two 32x8 matrices which can be combined as one 64x8 matrix.

CUSTOM CHASSIS

The Mainframes and Expansion Chassis can be supplied wired out to customer specified connectors or in special configurations.

PX/32 SWITCH MODULES

Each switch module has 32 single or two pole relays and includes the logic for Selecting the module, Selecting and Latching the relay and obtaining the Status of the relay. Status is obtained by checking the drive to the relays which verifies that the logic is operating correctly and that the selected relay is energized.

SINGLE POLE SWITCH MODULES

These Modules are available as either 2x16 Matrices or two 2x8 Matrices and with either Type S dry reed relays or Type M mercury wetted reed relays.
The inputs to the modules can be either BNC connectors(-N), screw terminals(-S) or 16 pin header (-H) for signal and shield, and the shield is carried through the module for maximum signal isolation.
The module outputs go to the 50 pin card edge connector which plugs into the motherboard bussing the modules into the matrix configuration.

PX/2x16-1 SWITCH MODULE

This is a 2x16 Switch Module shown in **Fig. 1** with two input connectors and 16 outputs on the card edge connector.

Sixteen of these modules can be assembled in the PX/512-1A Chassis to make a 32x16 Matrix as shown in the single pole version of **Fig. 5**.

Fig. 1 PX/2x16-1 Switch Module

PX/2(2x8)-1 SWITCH MODULE

This module has two 2x8 Matrices as shown in **Fig. 2** with 4 input connectors and two sets of 8 outputs on the card edge connector.

Sixteen of these modules can be assembled in the PX/512-1B Chassis to make two separate 32x8 Matrices or bussed on the motherboard as shown in the single pole version of **Fig. 6** to make one 64x8 Matrix.

Fig. 2 PX/2(2x8)-1 Switch Module

TWO POLE SWITCH MODULES

These Modules are available as either 2x16 Matrices or two 2x8 Matrices and with either Type S dry reed relays, Type M mercury wetted reed relays or Type LT low thermal relays.

The inputs to the modules can be either BNC receptacles (-N), 20 pin headers (-H) or screw terminals (-S).

Both the center conductor and isolated shield of the BNC are switched. The 20 pin header or screw terminals can be used for shielded twisted pair cables where the signal pair is switched and the shield is carried through the matrix.

The module outputs go to two 25 pin card edge connectors which plug into two motherboards bussing the modules into the matrix configuration.

PX/2x16-2 SWITCH MODULE

This is a 2x16 Switch Module shown in **Fig. 3** with two input connectors and 16 outputs on two card edge connectors.

Sixteen of these modules can be assembled in the PX/512-2A Chassis to make a 32x16 Matrix as shown in **Fig. 5**.
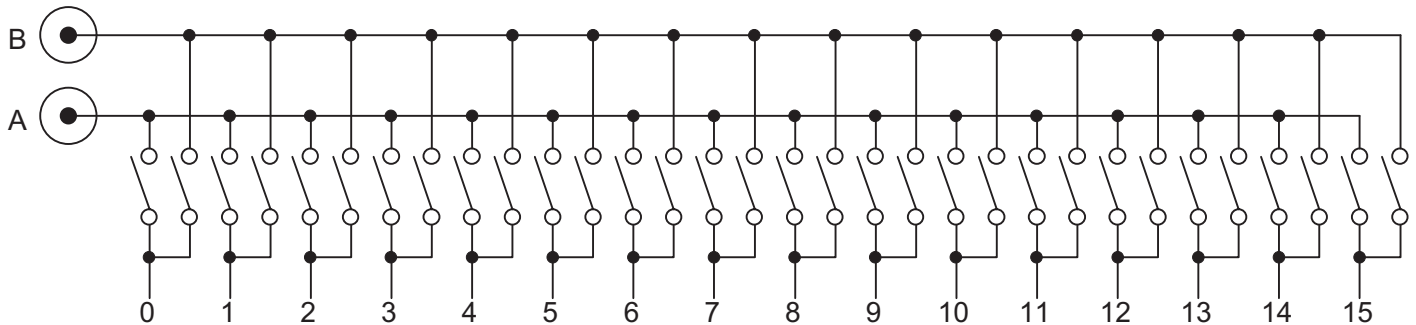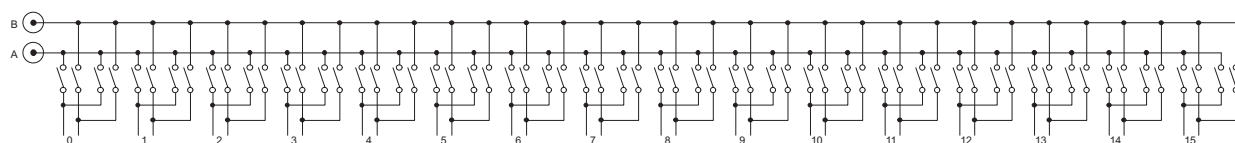

Fig. 3 PX/2x16-2 Switch Module

PX/2(2x8)-2 SWITCH MODULE

This module has two 2x8 Matrices as shown in **Fig. 4** with 4 input connectors and two sets of 8 outputs on the card edge connector.

Sixteen of these modules can be assembled in the PX/512-2B Chassis to make two separate 32x8 Matrices or bussed on the motherboard as shown in **Fig. 6** to make one 64x8 Matrix.
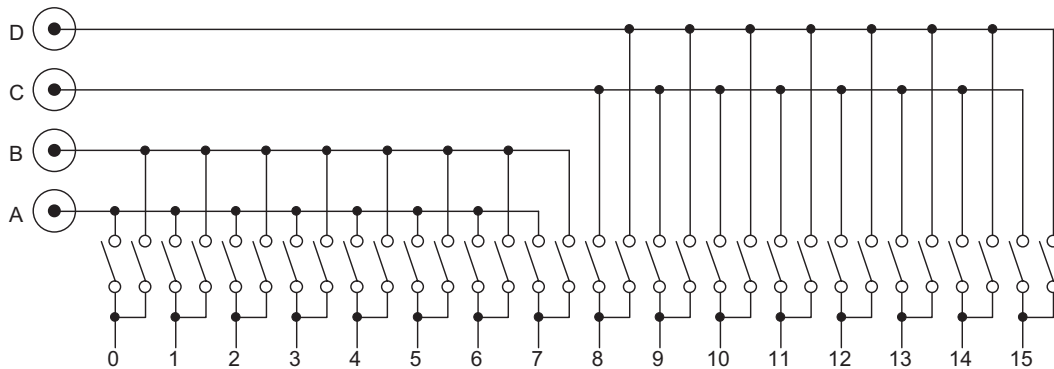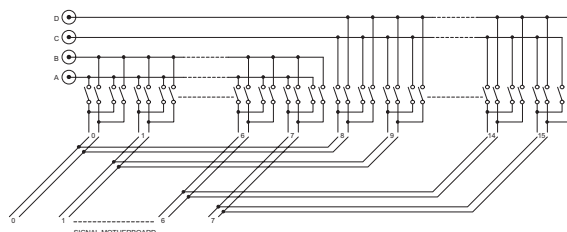

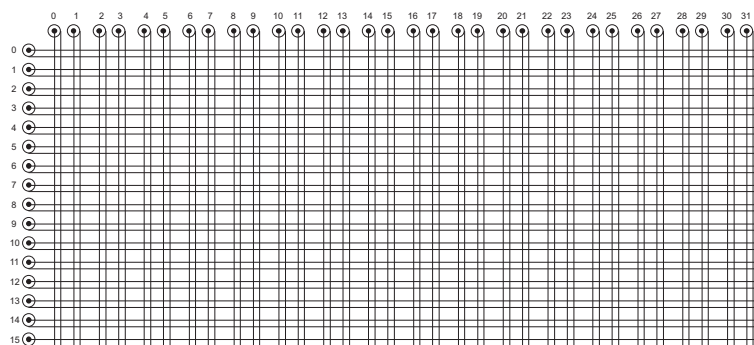Fig. 4 PX/2(2x8)-2 Switch Module

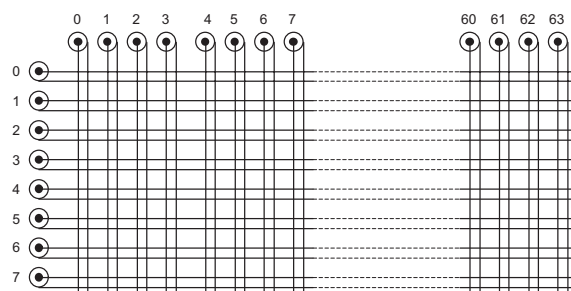# MATRIX CONFIGURATIONS

Fig. 5 32x16 Matrix

Fig. 6 64x8 Matrix

SWITCH SPECIFICATIONS

Three types of switches are available, the Type S, Type M and Type LT.

Type S Standard is a dry reed switch for most medium range applications.

Type M Mercury is a mercury wetted switch for high power or low contact resistance applications.

Type LT Low Thermal is a dry reed switch for low level applications with less than 1 microvolt offset.

All switches are guaranteed for 100 million operations when used within the following specifications:

	Type S	Type M	Type LT
Contact Rating	10VA	50VA	10VA
Maximum Switch Voltage	200V	500V	100V
Maximum Switch Current	0.5A	2A	0.2A
Breakdown Voltage	400V	1000V	200V
Operate Time, less than	1ms	2ms	1ms

MATRIX SPECIFICATIONS

The Matrices are designed for maximum bandpass and isolation between channels.

All test results are on a full chassis of 16 modules with 50 ohm source and 50 ohm termination.

32x16 MATRICES
- Bandpass   DC to 20 MHz
- Isolation   -40dB at 10 MHz
- Crosstalk   -30dB at 10 MHz

64x8 MATRICES
- Bandpass   DC to 10 MHz
- Isolation   -40dB at 10 MHz
- Crosstalk   -40dB at 10 MHz

GENERAL SPECIFICATIONS

Power - 100-130 Volts AC or 200-240 Volts AC, 50 to 60 Hz, 100 W.

Environment - Operating Temperature 0^0 to 50^0 C. Storage Temperature -25^0 to 65^0 C.

CONNECTOR OPTIONS

The Modules and Chassis are available with the following options selected by the suffix at the end of the Model Number:

-N Indicates the BNC receptacles with isolated shield for two pole switching and ground shield for single pole switching.

-H Indicates header connectors, with 16 pin headers for the single pole modules and 20 pin headers with two wire plus shield for two pole switching.

-S Indicates terminal with screw terminal mates which have two terminals for the single pole modules and three terminals for two pole modules.

-W Indicates special wiring to customer specification.

CONTROL MODULES

Plug in Modules control the PX/512 Mainframes from the IEEE488 Bus or the RS232 Serial Port.

The Controls can Select and Latch or Unlatch any Switch in the Matrix. The controls can also request the Status of any Switch or can Request the Status of the complete Matrix.

The cycle time to Select and Latch a relay and obtain status is 30 msec.

IF-5 IEEE488/RS232 COMBINED MODULE

This Module combines all the features of the RS232 Serial and IEEE488 GPIB Bus Modules detailed in the **Applications Bulletin AP-5**.

IF-6 LAN INTERFACE

This module interfaces between the Local Area Network and the RS232 Control Modules using TCP/IP commands as described in the **Applications Bulletin AP-5**.

MC-2 MANUAL CONTROL

This Manual Control has a Keypad and LCD Display on the front panel so that the operator can select any relay and Latch the Relay or check the Status of the Relay on the Display.

VMC VIRTUAL MANUAL CONTROL

This software enables the remote operator to view the Status of the Matrix using a full Graphical User Interface.

The matrix configuration is displayed and crosspoints are selected by a point and click operation. Each selected crosspoint is prominently shown on the display.

Custom labelling of the Inputs and Outputs can be programmed.

One optional mode of operation prevents selection of switches that would interconnect two Inputs or two Outputs.

RAM OPTION

This option is available with the above Control Modules and with the MESA Control Unit.

Switch selections can be stored in a battery back up RAM so that the switches can be latched to a preset configuration up to 1000 switch selections.

After power loss, the switch matrix will reset to the last selected switch configuration.

SOFTWARE

Drivers and/or sample programs are available for the most commonly available application programming languages.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Workmanship and Materials for a period of five years and that all switches are guaranteed for their Rated Operations.

FOR TECHNICAL ASSISTANCE CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM.

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526 (585) 381-4740 FAX (585) 381-0475

RJ SERIES
SWITCHING SYSTEMS
FOR COMMUNICATIONS AND AUTOMATED TEST

The RJ Series of Computer Controlled Switching Systems are engineered for both analog and digital communication applications. A modular design is used, and interchangeable Control Modules, Switch Modules and Display Modules plug into prewired chassis. This allows systems to be tailored to fit specific applications. Connectors are either RJ12 or RJ45, and up to 8 wires can be switched. Switchpoint Status Feedback is standard, and LED switch point Status Display is included with most models. Control options include: IEEE488 Bus (GPIB), RS232, 10Base-T Ethernet LAN and Universal Serial Bus (USB). Manual Controls such as the Palm PC Computing Platform are optionally available.

The units are available as either Mainframes with dedicated Control Modules and power supplies or as Expansion Chassis that are controlled and powered via a MESA Control Chassis.

RJM/128 Mainframe

RJV/48 Mainframe

RJA and RJM MATRICES - FEATURES

- Passive, bidirectional systems.
- Modularized design permits incremental expansion.
- Single chassis configurations from 2x4 to 16x8 (or 32x4).
- Larger systems built utilizing MESA Control Chassis and up to 16 Expansion Chassis.
- Full LED switchpoint Display with Status Feedback.

RJA MATRICES

- Low cost, high reliability units using reed relays.
- Suitable for analog voice and digital communications.
- RJ12 Telco connectors.
- Apps. include: Modems, ISDN, Serial Data, DSL, T1/E1.
- 2, 4, or 6 wires switched.
- Optional Type M Mercury Relays with 2 or 4 wire apps., capable of switching up to 500 volts, 2 amps or 50 watts
- Bandpass is 25 MHz (-3dB) with Crosstalk -60dB @ 5 MHz.

RJM MATRICES

- High performance systems designed for high speed digital data communications signals.
- CAT5 RJ45 connectors.
- Applications include: 10/100Base-T, T1, ISDN, DSL, ADSL.
- 4 or 8 wires switched using sensitive Type A relays.
- Capable of switching up to 150 volts and 1 amp.
- Bandpass is 30 MHz @ -3dB, Crosstalk is -60dB @ 20 MHz.

WARRANTY

All CYTEC products are warranted against defects in workmanship and materials for a period of five years.

RJB MATRICES

- Low cost, bidirectional four-wire Solid State Matrices.
- Applications include: 10Base-T, TTL, Token Ring, 0 to 5 volt analog signals.
- Standard matrix configurations are 8x8, 8x16 and 16x16.
- RJ45, D9 or IDC header connectors.
- Bandpass (-3dB) is 50 MHz at 50 ohms impedance.
- Crosstalk is -40dB @ 20MHz.

RJX MULTIPLEXERS/MATRICES

- Low cost, high reliability bidirectional systems.
- Applications include: 10Base-T, Token Ring, ISDN.
- 4 or 8 wire Type S Reed Relay switch modules with RJ45s.
- Multiplexers from 1x8 to 1x128. Matrices from 2x4 to 2x64.
- Full LED front panel Display and Status Feedback.
- Bandpass is 20 MHz at -3dB, Crosstalk is -60dB @ 5 MHz.

RJV MULTIPLEXERS/MATRICES

- High performance passive systems designed for high speed data communications.
- Apps. include: 10Base-T/100Base-T/Gigabit Ethernet, ATM.
- 4 or 8 wire Type A Switch Modules, CAT5 RJ45 connectors.
- Low Crosstalk, exceptional Longitudinal Balance, Low Insertion Loss.
- Bidirectional multiplexers from 1x12 to 1x144.
- Bidirectional matrices from 2x6 to 4x72.
- CAT5 compliant.
- Full Status Feedback.

RJM SERIES HIGH PERFORMANCE MATRICES

The RJM Series are high Performance, bidirectional, passive Matrices and are designed to switch high speed communication signals, including T1, E1, DSL and 100Base-T Ethernet. High sensitivity Type A Armature Relays and CAT5 RJ45 connectors are used to ensure that high pair-to-pair isolation, and CAT5 attenuation and crosstalk specifications are met. A modularized design is utilized, and each Mainframe is built with integrated power supplies, a Control Module and prewired Motherboards. CL8 Display Modules show switch point status. The RJM Switch Modules are available in versions switching from 2 or 4 of the EIA/TIA 568 specification pairs.
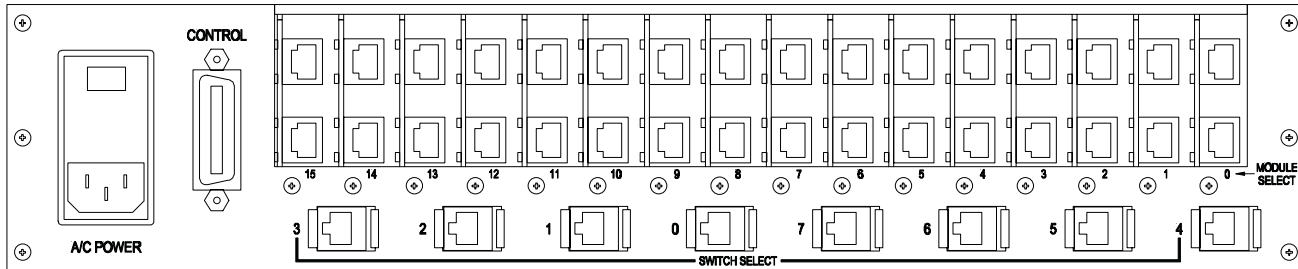

Fig. 1 RJM/16x8 Matrix - Rear View

RJM/128 MAINFRAMES

These are 19" rack mounting chassis, 3.5" high and 16" deep. Each Mainframe is assembled with power supplies and motherboards that hold one Control Module and up to 16 RJM Series Switch Modules. Signal connectors are CAT5 RJ45 jacks. One CL8 Module is required for each Switch Module. Three different standard matrix configurations are offered:

RJM/2(16x4) MAINFRAME

This chassis holds up to 16 RJM/2(1x4) Switch Modules and forms two separate 16x4 matrices as shown in **Fig. 2**. Each matrix has a **Bandpass** of DC to 30 MHz (-3dB). **Crosstalk** between signal pairs is less than -60dB at 20 MHz.
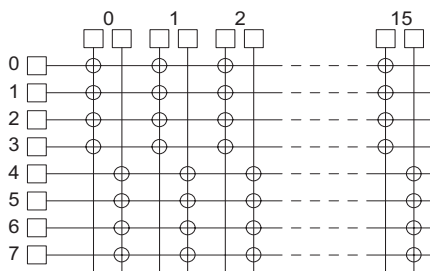
Fig. 2

RJM/16x8 MAINFRAME

This mainframe holds a maximum of 16 RJ/2(1x4) Switch Modules (each jumpered in a 1x8 configuration) to furnish a 16x8 Matrix. **Bandpass** is DC to 25 MHz and **Crosstalk** is less than -50dB at 20 MHz.

RJM/32x4 MAINFRAME

Bussing together the four output pairs (0A & 0B, 1A & 1B, etc) of the first two 16x4 matrices shown in **Fig. 2**, creates a single 32x4 matrix with a **Bandpass** from DC to 15 MHz and **Crosstalk** less than -45dB at 20MHz.

RJM/2(1x4)-4,-8 SWITCH MODULES

These modules are built with high sensitivity two pole Type A Armature Relays which insures high isolation among signal pairs. Modules switching either 4 or 8 pins on CAT5 RJ45 connectors are available and are defined by the corresponding part number suffix. Each two pole relay switches one pin pair on the RJ45 jacks as defined in the EIA/TIA 568 Specification - that is, Pins 1&2, 3&6, 4&5, 7&8. Built in pin jumpers allow the switch module to be configured as a single 1x8 Matrix as shown in Fig. 3.
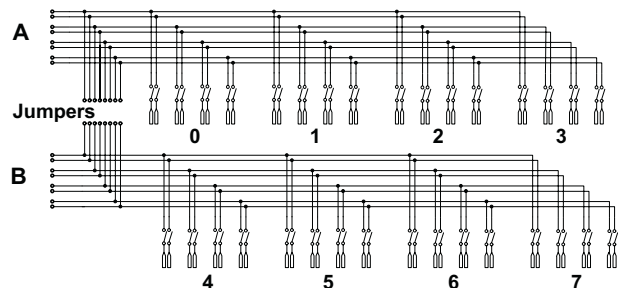
Fig. 3 RJM/2(1x4) Switch Module

Relay specifications are shown on the last page of this bulletin.

CL8 DISPLAY MODULES

One Display Module is required for each RJM Switch Module. These control the switch module and have LEDs that show switch status.

RJM/128 EXPANSION CHASSIS

These chassis are the same as the mainframes without power supplies or a control module. They are controlled and powered by a MESA Control Chassis as detailed in the MESA Bulletin.

RJV SERIES MULTIPLEXERS and MATRICES

The RJV Series are high performance, bidirectional, passive Multiplexers or Matrices designed for demanding communication applications such as 100Base-T Network Switching. These units are built with high sensitivity Type A Armature Relays to insure low signal-to-signal crosstalk. Exceptional longitudinal balance and low insertion losses are achieved at high data rates. Connectors are CAT5 RJ45. A modularized design is used, and each Mainframe is built with integrated power supplies, a Control Module and a motherboard that holds the RJV Switch Modules. This results in a great deal of configuration flexibility.

RJV/48 MAINFRAME

This chassis is 5.25" high and accepts up to four RJV Series Switch Modules. The modules can be used individually, or they can be bussed together in several different configurations. As a 48x1 Mux, **Bandpass** is 100 MHz at -2dB and Near End Crosstalk between wire pairs **(NEXT)** is -42dB at 80 MHz, which exceeds 100Base-TX network specifications.

RJV/144 MAINFRAME

This is a 19" rack mounting chassis, 10.5" high and 16" deep and is designed to hold up to twelve RJV Series Switch Modules. These can be used individually or bussed together in several configurations. In all configurations, 100Base-TX **Bandpass** and **NEXT** specifications are met.

RJV/144-E EXPANSION CHASSIS

This is the same as above but is powered and controlled via a MESA Control Chassis as detailed in the **MESA** Bulletin.
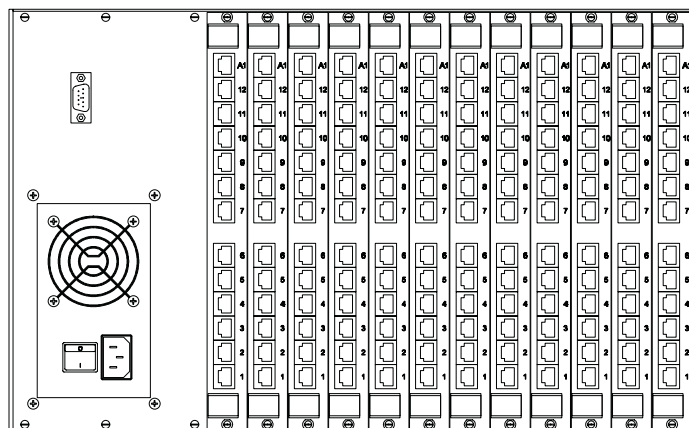
Fig. 4 RJV/144 Mainframe - Rear View

RJV SWITCH MODULES

All RJV Switch Modules use high sensitivity, high isolation Type A Armature Relays and CAT5 RJ45 connectors. Up to eight poles can be switched (but not on all models). Signals can be routed to the Common connectors on the individual modules or alternately to the motherboard bus. The latter interconnects the modules and provides larger multiplexers and matrices.

RJV/12x1-4, -8 SWITCH MODULE

Each module supplies a 12x1 Multiplexer as shown in **Fig. 5**. Four or 8 pole versions are available. Four modules can be placed in the RJV/48 chassis to supply four (12x1), two (24x1), or one (48x1) Mux. In the RJV/144 chassis, one (144x1), two (72x1), four (36x1), or twelve (12x1) Muxes can be configured using 12 switch modules.

RJV/4(1x2)-4, -8 SWITCH MODULE

Each module furnishes four individual 1x2 or "A/B" switches. Four and 8 pole versions are available. Form C relays are used, meaning each of the four switches has a Normally Closed position. In an RJV/48, four modules will furnish 16 A/B Switches, and in the RJV/144, 12 modules will give 48 switches.

RJV/6x2-4 SWITCH MODULE

These modules switch four poles in a 6x2 Matrix configuration as shown in **Fig. 6**. They can be assembled in the RJV/48 as one (24x2), two (12x2) or four (6x2) Matrices. In the RJV/144 , one (72x2), two (36x2), four (18x2) or twelve (6x2) Matrices can be achieved.

RJV/6x4-4 SWITCH MODULE

These also switch four poles but are configured as a 6x4 Matrix as shown in **Fig. 7**. They can be assembled in the RJV/48 to create one (24x4), two (12x4) or four (6x4) Matrices, and in the RJV/144 to make one (72x4), two (36x4), four (18x4) or twelve (6x4) Matrices.

Fig. 5

Backplane Connection

Backplane Connections

Fig. 6

Backplane Connections

Fig. 7

Four Pole Versions of Switch Modules are shown

The RJV Switch Modules can be assembled in many different ways to provide a number of additional configurations. Contact our Applications Engineers to discuss your specific needs.

RJB SERIES SOLID STATE SWITCH MATRICES

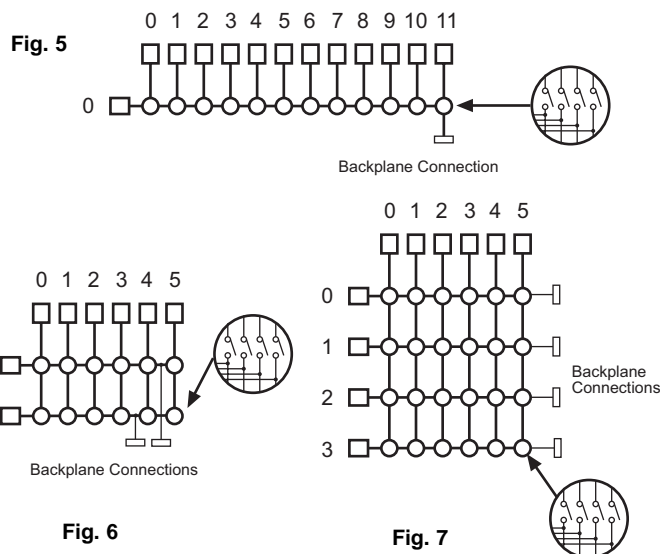The RJB Series are bidirectional, nonblocking, four wire Solid State Matrices and are used to switch the following signal types: TTL level analog or digital (0-5 volts), 10Base-T or Token Ring. Each Mainframe is built with integrated power supplies, a Control Module, either an 8x8 or 16x16 Solid State Switch Module and one of three types of built in Interface Modules. The Interface Modules adapt the solid state switch fabric to the signals that are to be switched.
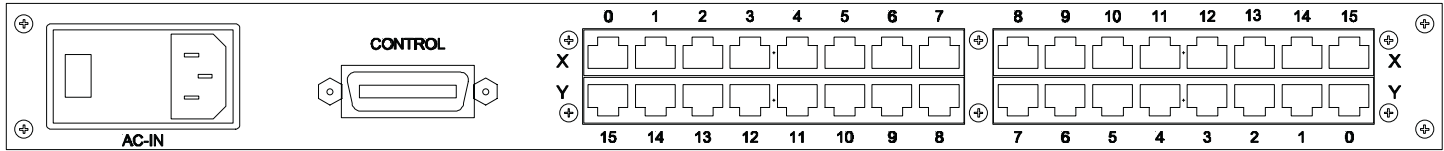
Fig. 8   RJB/16x16 Matrix with RJB/M2 Ethernet Adaptor Option

RJB/8x8 and RJB/16x16 MAINFRAMES

These are 19" rack mounting units, either 1.75" or 3.5" high. (Fig. 8 shows the 1.75" chassis.) Each chassis is built with the RJB/8x8 or RJB/16x16 Solid State Switch Module, one Control Module, power supplies and the appropriate Interface Modules. Standard connectors are: IDC headers for TTL, CAT5 RJ45s for Ethernet and 9 Pin D subminiatures for Token Ring. Other optional connectors can be specified by the user. Please contact our Applications Engineers for additional details.

RJB SOLID STATE SWITCH MODULES

The solid state switch fabric is the heart of the matrix and two standard models are offered: the RJB/8x8 and the RJB/16x16. These furnish nonblocking, bidirectional four pole analog switching of 0 to +5 volts signals with a low path ON resistance of approximately 3 ohms. Bandpass (-3dB) is DC to 50 MHz at balanced relay and Crosstalk is -40dB at 20 MHz.

RJB/8x8 SWITCH MODULE

This is an 8x8 four wire solid state matrix. Any one of eight individual four wire inputs can be connected to one of eight four wire outputs. Signal inputs and outputs are wired from two 34 pin IDC header connectors located on the Switch Module to the integrated Interface Modules, which also provide the rear panel connectors.

RJB/16x16 SWITCH MODULE

This is a 16x16 four wire bidirectional matrix. Any one of 16 separate four wire inputs can be switched to any one of 16 individual four wire outputs. Signal inputs and outputs are wired out from four 34 pin header connectors located on the Switch Module to the required Interface Modules. The Interface Modules furnish the rear panel signal connectors.

RJB INTERFACE MODULES

The core RJB Solid State Switch Fabric handles TTL level signals of 0 to +5 volts. The RJB Interface Modules are an interface between the core Switch Fabric and the input and output signals that are to be switched. These Interface Modules enable the matrix to handle 10Base-T and Token Ring signals. Each Interface accepts eight input or output signals, therefore, two are required in the RJB/8x8 Matrix and four are needed in the RJB/16x16.

RJB/M1 INTERFACE

This is used whenever TTL level signals are being switched. The RJB/M1 essentially provides a hard wired connection between the RJB/8x8 or RJB/16x16 Solid State Switch Module and 34 pin header connectors on the chassis rear panel, with no signal transformation. **Analog Pulse** rates of 50 MHz can be handled by this interface with low crosstalk between signal paths.

RJB/M2 INTERFACE

This adapts the unit to 10Base-T Ethernet LANs. This interface is built with CAT5 RJ45 rear panel connectors and isolation transformers as required by Ethernet. **Bandpass** and **Crosstalk** meet all 10Base-T Specifications.

RJB/M3 INTERFACE

This is used when Token Ring is to be switched. The modules supply D9 connectors and transformers as required by Token Ring Networks. The D9 connector size increases the chassis height to 3.5".

OPTIONS

Custom Interface Modules can be supplied for switching other signal types. Please consult our Applications Engineers.

RJA SERIES HIGH RELIABILITY MATRICES

The RJA Series are low cost, high reliability, passive Matrices that are designed for analog voice and digital communication applications. Two, four or six pins on RJ12 Jacks are switched using reed relays. Each mainframe holds power supplies, a Control Module, up to 16 Switch Modules and CL8 Display Modules. CL8 Modules control the switch module and show switch status.

RJA/128 MAINFRAMES

These are 19" rack mounting chassis, 3.5" high and 12" deep. Signal connectors are RJ12 Telco Jacks. Three different matrices are offered.

RJA/2(16x4) MAINFRAME

This unit furnishes two independent 16x4 matrices when filled with 16 RJ/2(1x4) Switch Modules as shown in **Fig. 1** on the second page of this bulletin. **Bandpass** is DC to 30 MHz, and **Crosstalk** is less than -60dB at 5 MHz.

RJA/16x8 MAINFRAME

This chassis holds 16 RJ/2(1x4) Switch Modules jumpered as 1x8s to form a 16x8 Matrix. **Bandpass** is DC to 25 MHz with **Crosstalk** less than -60dB at 1 MHz.

RJA/32x4 MAINFRAME

Bussing together the four output pairs (0A & 0B, 1A & 1B, etc.) of the two 16x4 matrices shown in **Fig. 2** on the second page of this bulletin creates a single 32x4 matrix with a **Bandpass** from DC to 20 MHz and **Crosstalk** less than -60dB at 1 MHz.

RJA/128 EXPANSION CHASSIS

These chassis are the same as above but are powered and controlled via a MESA Control Chassis as detailed in the **MESA** Bulletin.

RJ SWITCH MODULES

Each RJ Series Switch Module is built with eight Type S Standard or Type M Mercury Reed Relays and two RJ12 Jacks. Either 2, 4 or 6 poles are switched. Each module provides two 1x4 matrices as shown in Fig. 9, with optional jumpers creating a 1x8 configuration.

RJ/2(1x4)-2 SWITCH MODULE

Eight 2 pole relays switch the inner pins on the RJ12 connectors, and the outer four pins are wired as shields.

RJ/2(1x4)-4 SWITCH MODULE

Similar to the above, this is built with 4 pole relays. The RJ12's inner four pins carry signals while the outer two are shields.

RJ/2(1x4)-6 SWITCH MODULE

This uses 6 pole relays and switches all pins on the RJ12s. It is not available with Type M relays.

Fig. 9
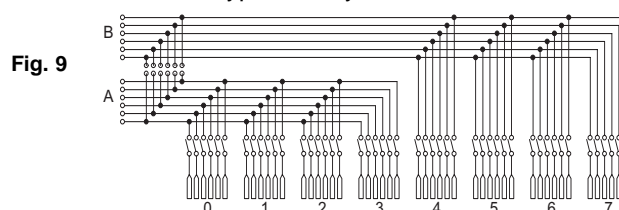
CL8 DISPLAY MODULES

One Display Module is required for each RJA Switch Module.

RJX SERIES HIGH RELIABILITY MULTIPLEXERS

The RJX Series are low cost, passive Multiplexers. These systems are designed to switch communications signals such as analog voice and 10Base-T Ethernet. Signal connectors are RJ45 Jacks, and both four and eight pole modules are available. The four wire versions switch Pins, 1, 2, 3 and 6 of the RJ45s. Each Mainframe is built with power supplies, a Control Module and prewired motherboards that hold the RJX Switch Modules. A full LED Display is included.

RJX/32 MAINFRAME

This unit is 3.5" high and accepts up to four RJX Switch Modules. It can be configured as either a 32x1 Multiplexer or 16x2 Matrix. **Bandpass** as a 32x1 Multiplexer is -3dB at 35 MHz, and **Crosstalk** is -40dB at 10 MHz.

RJX/128 MAINFRAME

This unit is 8.75" high and accepts up to 16 RJX Switch Modules and 16 Display Modules. Many different configurations are possible, ranging from sixteen individual 1x8 multiplexers up to either a 128x1 multiplexer or a 64x2 matrix. **Bandpass** as a 128x1 mux is DC to 15 MHz at -3dB and **Crosstalk** is -30dB at 10 MHz.

RJX/8x1-ISO SWITCH MODULES

This module has eight, 4 or 8 pole Type S Standard Dry Reed Relays arranged as an 8x1 multiplexer as shown in **Fig. 10**. **Bandpass** is 80 MHz at -1dB and **Crosstalk** is -40dB at 10 MHz.

RJX/4x2-ISO SWITCH MODULES

This module has eight, 4 or 8 pole Type S Reed Relays arranged in a 4x2 configuration. The **Bandpass** at -1dB is 80 MHz and **Crosstalk** is -40dB at 10 MHz.

Fig. 10

CL8 DISPLAY MODULES

One CL8 Display Module is required for each Switch Module **only** in the **RJX/128 Mainframe**.

CONTROLS

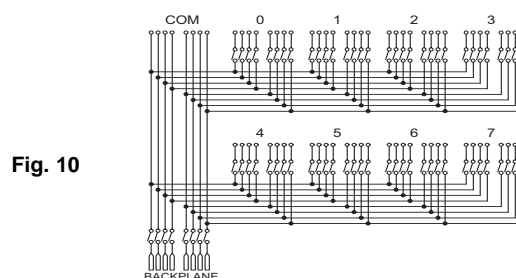**The RJ Series Mainframes are computer controlled via: IEEE488 BUS, RS232 Serial, Ethernet LAN, Universal Serial Bus (USB) or TTL Parallel Port. The Control Module selects any Mainframe switch point and is able to Latch, Unlatch and Request Status of the switch in both Matrix and Multiplex Modes.**
In the Matrix Mode, any number of switches can be closed at the same time. In the Multiplex Mode, only one switch can be closed at a time.

RJA, RJM, RJX/128 CONTROL MODULES

IF-1 PARALLEL PORT
This requires 14 individual binary, TTL level lines from the controlling computer. These select Switch and Mode, Strobe the selected command and return switch point Status.

IF-3 RS232 SERIAL
This module has all the RS232 features detailed in Applications Bulletin AP-5.

IF-4 IEEE488 BUS TALK/LISTEN
This module has all the IEEE488 BUS features detailed in Applications Bulletin AP-5.

IF-5 IEEE488/RS232
This module combines both the IEEE488 BUS and RS232 features detailed in Applications Bulletin AP-5.

IF-6 LAN INTERFACE
This module allows control via a Local Area Network using TCP/IP protocols detailed in the AP-5 Bulletin.

IF-7 COMBINED USB/RS232
This control module is plug-and-play compatible with Universal Serial Bus and furnishes dual controls via both RS232 and USB, allowing users to switch to USB control as COM ports become obsolete on new computers.

M/128 MANUAL CONTROLS
Thumbwheels and switches on the front panel select and control up to 128 relays.

RJX/32 MAINFRAME CONTROLS

IF-3B RS232 SERIAL
This Control Module has all the RS232 features detailed in Applications Bulletin AP-5.

IF-4B IEEE488 BUS TALK/LISTEN
This module has all the IEEE488 BUS features detailed in Applications Bulletin AP-5.

IF-6 LAN INTERFACE
This module allows control via a Local Area Network using TCP/IP protocols detailed in the AP-5 Bulletin.

IF-7B COMBINED USB/RS232
This control module is plug-and-play compatible with Universal Serial Bus and furnishes dual controls via both RS232 and USB, allowing users to switch to USB control as COM ports become obsolete on new computers.

M/32 MANUAL CONTROLS
Thumbwheels and switches on the front panel select and control all relays.

GENERAL SPECIFICATIONS
WEIGHT - Weight is dependent on chassis type and the number of modules. Please contact CYTEC for specific details.
POWER - 100 watts at 100-130 Volts AC or 200-260 Volts AC.
ENVIRONMENT - Operating 0^0 C to 50^0 C
Storage -25^0 C to 65^0 C

RJV AND RJB SERIES CONTROLS

IF-3C RS232 SERIAL
This module has all the RS232 features detailed in Applications Bulletin AP-5.

IF-4C IEEE488 GPIB
This module has all the IEEE488 BUS features detailed in Applications Bulletin AP-5.

IF-6 LAN INTERFACE
This module allows control via a Local Area Network using TCP/IP protocols detailed in the AP-5 Bulletin.

IF-7C COMBINED USB/RS232
This control module is plug-and-play compatible with Universal Serial Bus and furnishes dual controls via both RS232 and USB, allowing users to switch to USB control as COM ports become obsolete on new computers.

MC/2 MANUAL CONTROL - RJV ONLY
This Manual Control Option has a Keypad and LCD Display on the front panel so that the operator can select any relay and verify that the relay has been selected via the display. It is **only** available for the **RJV** Series.

ADDITIONAL MANUAL CONTROL OPTIONS
The following Manual Control Options are available for ALL chassis mentioned in this Bulletin. Contact our Technical Sales Representatives for more details and information.

VMCS
This Virtual Manual Control Software enables a remote operator to view the Status of the Matrix and to Control Switch Selection using a full Graphical User Interface.

PALM PC MANUAL CONTROL
This is currently available for use with the IF-4 IEEE488 Control Module. Application Programs running on the Palm PC display a virtual keypad manual control. It may be purchased with or without the Palm PC itself.

SWITCH SPECIFICATIONS
The RJM Matrices and RJV Multiplexers are built with high sensitivity Type A Armature relays. The RJB is a solid state (only) matrix. All other units are supplied with Type S Standard Dry Reed Relays. The RJA Matrices can optionally be built with Type M Mercury Wetted Reed Relays in the 2 and 4 pole versions only.

SPECIFICATION	TYPE S	TYPE M	TYPE A
Contact Rating VA	10	50	30
Switching Voltage DC	200V	500V	110V
Switching Current DC	.5A	1.0A	1.0 A
Carrying Current DC	1.0A	2.0A	1.0A
Breakdown Voltage DC	400V	1000V	750V
Operate Time msec	1	2	3

CONTACT 1-800-346-3117or WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE

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2555 Baird Road, Penfield, New York 14526   (585) 381-4740 FAX (585) 381-0475

RS SERIES SWITCHING SYSTEMS
FOR AUTOMATIC TEST AND COMMUNICATIONS

The RS Series of computer controlled switching systems are designed to switch multiwire groups of signals of up to 25 wires. These systems are typically used for signals such as parallel TTL, RS232, RS422, WAN or Modems, but they can also be used for any group of analog or digital signals having a bandpass up to 30 MHz or data rate up to 20 Mbps. A modular design concept is used that provides configuration flexibility by allowing display modules, different control modules and switch modules to be assembled in one chassis.

LED displays and switch point Status Feedback are available on most systems. Computer control via IEEE488 (GPIB) and RS232 is standard, while TCP/IP Ethernet LAN, USB and manual controls are optionally available.

RS/16 Mainframe

RSM/8x8 Mainframe

There are three basic Series: (1) RS, (2) RSS and (3) RSM.

The RS Series are passive, bidirectional relay-based Multiplexers, connecting one of up to 16 multiwire signal groups to a single signal common. Nine, fifteen or twenty-five wires are switched simultaneously.

The RSS Series are solid state, nonblocking, full fan-out matrices for single wire or differential pair signals. Any input can be connected to one, several or all outputs.

The RSM Series are bidirectional, non blocking relay matrices. A modular design allows the configuration of matrices from 1x8 or 2x4 up to 16x8 or 32x4. Nine, fifteen or twenty-five wires are switched together.

RS MULTIPLEXERS

These pre-wired chassis hold RS Switch Modules built with D9, D15 or D25 style connectors and switch 9, 15 or 25 wires.

RS/16 Mainframe accepts up to 16 of the RS Modules as a 16x1 Multiplexer.

RS/16-E Expansion Chassis may be used with a MESA controller to build multiple chassis multiplexers up to 256x1, depending on bandpass restrictions.

RSS MATRIX

This is made up of 16x8 Solid State Modules plugged into pre-wired RSS Chassis. Each chassis holds up to 16 modules. The following Switch Modules are supplied:

RSS/16x8-A switches $\pm$ 5 volt analog signals.

RSS/16x8-422 is used for differential RS422 signals.

RSS/16x8-TTL has TTL inputs and outputs.

RSS EXPANSION CHASSIS

These are built similar to the Mainframes except they are not built with control modules or power supplies. They are controlled and powered from a MESA Chassis as described in the **MESA Bulletin.**

RSM MATRICES

These are pre-wired chassis in the requested Matrix configurations. They hold up to 16 of the RSM Switch Modules. Switch Modules are available that switch either 9, 15 or 25 wires to D9, D15 or D25 connectors.

RSM MAINFRAMES

RSM/16x8 Mainframe holds 16 of the RSM/1x8 Switch Modules in a 16x8 Matrix configuration.

RSM/32x4 Mainframe holds 16 of the RSM/2(1x4) Switch Modules in a 32x4 Matrix configuration.

RSM/2(16x4) Mainframe holds 16 of the RSM/2(1x4) Switch Modules as two separate 16x4 Matrix configurations

RSM EXPANSION CHASSIS

These are similar to the Mainframes except they are not built with control modules. They are controlled from a MESA Chassis as described in the **MESA Bulletin.**

RSM SWITCH MODULES

These Switch Modules are available in two basic configurations, switching either 9, 15 or 25 wires to D9, D15 or D25 connectors.

RSM/2(1x4) Module has two separate 1x4 multiwire matrix configurations.

RSM/1x8 Module has one 1x8 multiwire matrix configuration.

RS MULTIPLEXER

These are passive, relay-based multiplexers switching from 9 to 25 wire signals such as RS232, RS422 or TTL in applications including Modems, Printers or Token Ring.
Their Bandpass is DC to 20 MHz.

RS/16 MAINFRAME

These are 19" rack mounted units 3.5" high and 15.6" deep with power supplies, LED Displays and pre-wired motherboards which accept the RS Switch Modules. This unit holds up to sixteen RS Switch Modules and has sixteen switchpoint status LEDs on the front panel. It can switch up to 25 wires from sixteen input ports to one output port, or the reverse, as shown in **Figure 1**.

EXPANSION CHASSIS

These are built similar to the Mainframes except they are not built with control modules or power supplies. They are powered and controlled from a MESA Chassis as described in the **MESA Bulletin**.

Up to 16 Devices   Common Device

Bi-directional Switching from 9 to 25 wires
Figure 1
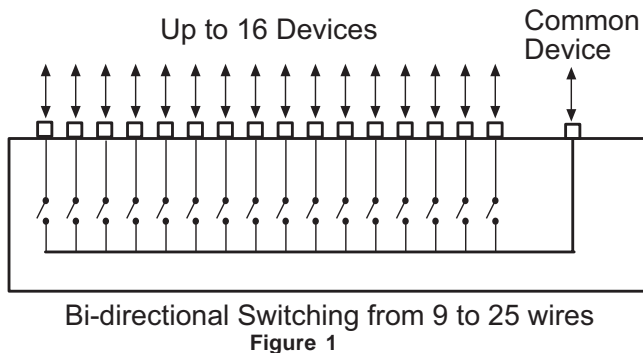
RS SWITCH MODULES

The RS/9, RS/15 and RS/25 Modules are built with Type A relays, switching 9, 15 and 25 poles. Connector types are subminiature D9, D15 or D25, and either -P pins or -S sockets can be user specified.

RS/9 SWITCH MODULE

This module is built with a D9 connector and Type A relays and switches nine wires.

RS/15 SWITCH MODULE

This module has a D15 connector with Type A relays switching all fifteen wires.

RS/25 SWITCH MODULE

This module utilizes a D25 connector and Type A relays switching all twenty-five wires.

PLUG or SOCKET D TYPE CONNECTORS

To specify Plug (male) D type connectors, add -P to the Switch Module part number. Adding -S specifies Socket (female) connectors. For example, the RS/15-S is built with a subminiature D15 Socket connector.

AVAILABLE MATING CONNECTORS

The following mating connectors can be purchased for a small additional charge.

D9-R	-	Nine pin ribbon cable connector
D9-C	-	Nine pin crimp type connector
D15-R	-	Fifteen pin ribbon cable connector
D15-C	-	Fifteen pin crimp type connector
D25-R	-	Twenty-five pin ribbon cable connector
D25-C	-	Twenty-five pin crimp type connector

RSS MATRIX

These are built up from the RSS/16x8 Solid State Modules, which in turn are plugged into pre-wired RSS chassis. Each module is an individual 16x8 Matrix, and multiple modules can be interconnected to form larger matrix configurations.

RSS/256 MAINFRAME

This is a 19" rack mounted chassis, 5.25" high and 15.6" deep, pre-wired to accept the RSS Series of Switch Modules. The unit has one slot that holds the required control module, as well as slots for up to sixteen RSS/16x8 Switch Modules. Multiple switch modules can be combined to form larger matrices.

EXPANSION CHASSIS

Expansion Chassis are built similar to the Mainframes except they are not built with control modules or power supplies. They are powered and controlled from a MESA Chassis as described in the **MESA Bulletin**.

RSS/16x8 SOLID STATE MODULES

This is a solid state switch module and it is configured as a 16 by 8 (16x8) matrix. Three separate versions are built to handle either analog, TTL or RS422 signals. The 16 inputs are wired to a 34 pin header, the 8 outputs to a 20 pin header. The module is full fan out so any input can be connected to one, several or all outputs.

RSS/16x8-A SWITCH MODULE

This module switches +/-5 volt analog signals and has a typical ON resistance of 60 ohms. Bandpass is 50 MHz when terminated into 1K ohms. It can be used as a 16x8 or 8x16 matrix.

RSS/16x8-422 SWITCH MODULE

Switches sixteen individual, two wire RS422 signal inputs to 8, two-wire RS422 outputs as shown in **Fig. 2** at up to 10 Mbps. Any input can be connected to one, several or even all outputs.

16 X 8 MATRIX
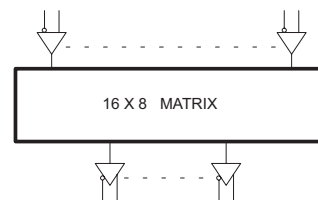
Fig. 2

RSS/16x8 TTL SWITCH MODULE

This module switches TTL level signals and can be used as either a 16x8 or 8x16 matrix. Any input can be connected to any or all outputs.

CUSTOM SWITCH MODULES

Switch Modules can be supplied that switch different types of input and output signals on the same module. For example, one module might have 16 two wire RS422 inputs switched into eight single wire TTL outputs.

MATING CONNECTORS

J20-R	-	Twenty pin ribbon cable type header connector
J20-C	-	Twenty pin crimp type header connector
J34-R	-	Thirty-four pin ribbon cable type header connector
J34-C	-	Thirty-four pin crimp type header connector

RSM MATRICES

RSM Matrices are designed to switch multiwire data communications signals such as RS232, RS422 and Token Ring. RSM Systems can switch 9, 15 or 25 wires and are available with D9, D15 or D25 style connectors.
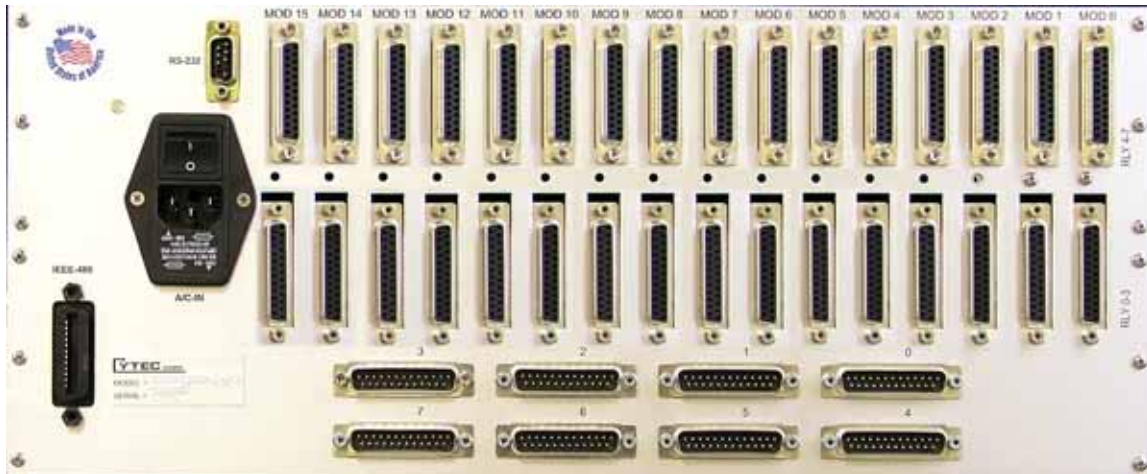
MAINFRAMES

Mainframes are 19" rack mounted chassis, 7" (4U) high and 21" deep, with power supplies and pre-wired motherboards that hold Switch Modules, LED Display Modules and Control Modules.

RSM/16x8 SERIES

These Mainframes hold up to 16 of the RSM/1x8 Switch Modules assembled in a 16x8 configuration.

Bandpass is DC to 40 MHz (-3dB).

RSM/16x8-25 chassis holds the RSM/1x8-25 Modules, switching 25 wires from D25 connectors.

RSM/16x8-15 chassis accepts the RSM/1x8-15 Modules and switches 15 wires on D15 connectors.

RSM/16x8-9 chassis holds the RSM/1x8-9 Modules, switching 9 wires to D9 connectors.

RSM/32x4 SERIES

These Mainframes are built with up to 16 of the RSM/2(1x4) Switch Modules assembled in a 32x4 configuration.

Bandpass is DC to 30 MHz (-3dB).

RSM/32x4-25 chassis accepts the RSM/2(1x4)-25 Modules, switching up to 25 wires to D25 connectors.

RSM/32x4-15 chassis holds the RSM/2(1x4)-15 Modules and switches up to 15 wires from D15 connectors.

RSM/32x4-9 is built with the RSM/2(1x4)-9 Modules, switching up to 9 wires on D9 connectors.

RSM/2(16x4) SERIES

These Mainframes hold up to 16 of the RSM/2(1x4) Switch Modules assembled as a dual 16x4 configuration.

Bandpass is DC to 40 MHz (-3dB).

RSM/2(16x4)-25 chassis accepts the RSM/2(1x4)-25 Modules, switching up to 25 wires with D25 connectors.

RSM/2(16x4)-15 chassis is built the RSM/2(1x4)-15 Modules switching up to 15 wires to D15 connectors.

RSM/2(16x4)-9 chassis holds the RSM/2(1x4)-9 Modules switching, up to 9 wires to D9 connectors.

EXPANSION CHASSIS

Expansion Chassis are built similar to the Mainframes except they are not built with control modules. They are controlled from a MESA Chassis as described in the MESA Bulletin.

SWITCH MODULES

The RSM Switch Modules are built as either a single 1x8 matrix, or as a dual 1x4 matrix configuration. They are bidirectional and switch 9, 15 or 25 wires to D9, D15 or D25 connectors. Switching is done with high reliability, passive Type A Relays.

RSM/1X8 SWITCH MODULES

These utilize a 1x8 configuration as shown in **Fig. 3**.
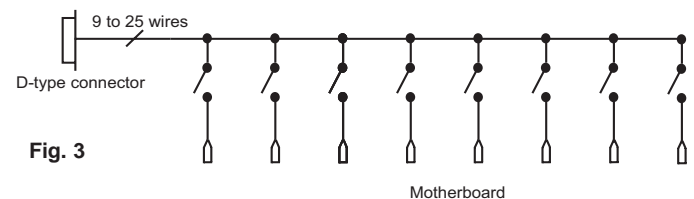
Fig. 3

RSM/1x8-25 switches 25 wires from D25 connectors and are used with the RSM/16x8-25 Chassis

RSM/1x8-15 switches 15 wires using D15 connects and are assembled in the RSM/16x8-15 Chassis.

RSM/1x8-9 switches 9 wires using D9 connectors and plug into the RSM/16x8-9 Chassis.

RSM/2(1X4) SWITCH MODULES

These modules are built as a dual 1x4 configuration as shown in **Fig. 4** :

Fig. 4

RSM/2(1x4)-25 switches 25 wires using D25 connectors in either the RSM/32x4 or RSM/2(16x4) Chassis.
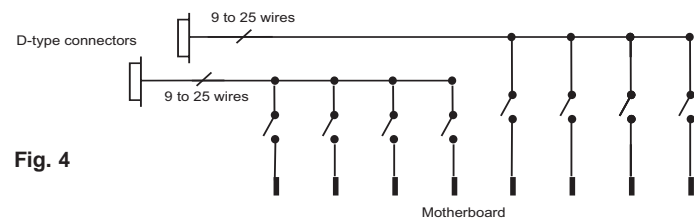
RSM/2(1x4)-15 switches 15 wires from D15 connectors and are used in the RSM/32x4 or RSM/2(16x4) Chassis.

RSM/2(1x4)-9 switches 9 wires using D9 connectors in the RSM/32x4 or RSM/2(16x4) Chassis.

CONTROLS

The RS Series of computer controlled Mainframes are available with the following controls: combined IEEE488/RS232 (standard), or optional Parallel Port TTL, Ethernet LAN or USB. The controls select any switch and can Latch, Unlatch and request Status of the switch using either Matrix or Multiplex Modes. In the Matrix Mode, any number of switches can be Latched as required. In the Multiplex Mode, only one switch can be Latched at any time; any previously latched switches are cleared.

RS MULTIPLEXER CONTROLS

IF-1 PARALLEL PORT
TTL compatible inputs select and Switch and Mode, Strobe the selection and also return Status.

IF-5 IEEE488/RS232 COMBINED CONTROL
This module provides control via both IEEE488 and RS232 and has all the features detailed in Applications Bulletin AP-5.

IF-6 ETHERNET LAN INTERFACE
This module interfaces between the Local Area Network and the RS232 controls using TCP/IP protocols as detailed in Applications Bulletin AP-5.

IF-7 EXTERNAL USB/RS232 INTERFACE
This external cable plugs into a USB port on the controlling computer and the Cytec Mainframe's RS232 Port. Permits control via USB at up to 19,200 bps.

PB/16 MANUAL CONTROLS
Optional pushbutton switches on the front panel can select and control up to 16 switch points when used with the IF-5, IF-6 and IF-7 Controls.

RSS MATRIX CONTROLS

IF-J5 IEEE488/RS232 COMBINED
This module controls up to sixteen RSS/16x8 Solid State Switch Modules with both the RS232 and IEEE488 features detailed in Applications Bulletin AP-5 with the exception that Status Return is not available.

IF-6 EXTERNAL LAN INTERFACE
This module interfaces between the Local Area Network and the RS232 Controls using TCP/IP protocols as detailed in Applications Bulletin AP-5.

IF-7 EXTERNAL USB/RS232 INTERFACE
This external cable plugs into a USB port on the controlling computer at one end and the Cytec Mainframe's RS232 Port on the other. Allows control via USB at up to 19,200 bps.

MC-2 MANUAL CONTROL
This manual control provides a front panel keypad and display which selects any switch and confirms the command operation.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in workmanship and materials for a period of 5 years. Relays are guaranteed for their rated operations when used within their published voltage, current and power specifications.

CUSTOM OPTIONS

Many CYTEC Switching Systems are available with custom configurations, connectors or controls. Please contact Cytec with your specific needs.

RSM MATRIX CONTROLS

CL8 DISPLAY/DRIVER MODULE
One CL8 Module is required for each RSM Switch Module. This module decodes logic and drives the Switch Module relays. A discrete LED, visible through the front panel, is wired to each drive, providing confirmation of all latched switchpoints. The LEDs are an extremely valuable aid in debugging and troubleshooting.

IF-1 PARALLEL PORT
TTL compatible inputs select any Switch and Mode, Strobe the selection and also return Status.

IF-5 IEEE488/RS232 COMBINED CONTROL
This module furnishes both the IEEE488 and RS232 control features detailed in Applications Bulletin AP-5.

IF-6 LAN INTERFACE
This module interfaces between the Local Area Network and the RS232 Controls using TCP/IP commands as detailed in Applications Bulletin AP-5.

IF-7 EXTERNAL USB/RS232 INTERFACE
This external cable plugs into a USB port on the controlling computer and the Cytec Mainframe's RS232 Port. Permits control via USB at up to 19,200 bps.

MC-2 MANUAL CONTROL
This manual control provides a front panel keypad and display that selects any switch and confirms the command operation.

SPECIFICATIONS

GENERAL SPECIFICATIONS
WEIGHT - Maximum weight with full complement of Modules in the RSM/16x8 is less than 50 lbs. All other units are less than 25 lbs.

POWER - 100 watts at 100-130 Volts AC or 200-260 Volts AC.

ENVIRONMENT -   Operating $0^0$to 50 ^{0}C
                     Storage -25^0C to 65^0C

SWITCH SPECIFICATIONS

Type S Standard dry reed relays are for general purpose instrumentation level signals.   These have a life of 100 million operations when utilized within the specified signal ratings.

Type A relays are sensitive, high reliability armature relays and are well suited for multiple wire data signals. They are rated for 10 million operations when used as specified.

SPECIFICATION	TYPE A	TYPE S
Contact Rating VA	30	10
Switching Voltage DC	110V	200V
Switching Current DC	1.0A	.5A
Carrying Current DC	1.0A	1.0A
Breakdown Voltage DC	750V	400V
Operate Time mSec	3	1

CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   FAX (585) 381-0475

VDX SERIES
VIDEO AND RF SWITCHING SYSTEMS

CYTEC's VDX Series of Video and RF Switching Systems are based on a solid state switch fabric and are available in nonblocking, full fan-out configurations of 16x16 and 32x32, with bandpass to 200 MHz. Input and output buffers can be added to the basic switch fabric allowing a broad range of both 75 and 50 ohm impedance signals to be switched. Control options include RS232 Serial, IEEE488 GPIB, TCP/IP 10BaseT LAN. A Manual Control Keypad option is available.

TYPICAL APPLICATIONS INCLUDE:
- **Programmable Routing of T3/DS3, Video or Low Level RF (Antenna Downlink, IF, etc).**
- **Broadcast Video to Multiple Locations.**
- **Signal Distribution for Communications and Test.**
- **Automated Patch Panels.**

VDX/32x32 Chassis w/ Keypad Manual Control

VDX CHASSIS
The VDX Chassis are standard 19" rack mount with either RS232 or IEEE488 Control and BNC Connectors. Any input to any or all outputs.

The following chassis are available:

VDX/16x16 Mainframe - 3.5" high and 15.6" depth

16x16 Matrix - (any input to any or all outputs)

VDX/32x32 Mainframe- 5.25" high and 15.6 " depth

32x32 Matrix (any input to any or all outputs)

VDX/32x32-E Expansion Chassis - is used for building larger systems. Multiple VDX Chassis can be controlled from one MESA Control Chassis shown in the **MESA Bulletin.**

CONTROL OPTIONS

IF-3P RS232 SERIAL

This Module has all the RS232 features detailed in Applications Bulletin AP-5.

IF-4P IEEE488 BUS (TALK/LISTEN)

This Module has all the IEEE488 features detailed in Applications Bulletin AP-5.

IF-6 TCP/IP LAN/RS232 INTERFACE

This Module uses TCP/IP to furnish control from a Local Area Network as described in AP-5

Please see the reverse side for complete Specifications.

VDX/16x16 MAINFRAME

This Chassis consists of a single ended Solid State 16x16 Matrix that routes 75 ohm signals up to 200 MHz in a nonblocking (any input to any output) and full fan-out (one input to several or all outputs) configuration. The basic unit holds the necessary power supplies and the switch matrix module. The system is completed by adding the desired control module and any required input or output buffers. The buffers are optional, and when used, supply impedance matching and/or signal level transformations. This design allows a large variety of signal types to be switched.

VDX/32x32 MAINFRAME

This Chassis is a nonblocking, full fan-out solid state matrix. **Crosstalk** is less than -60dB at 10MHz and **Bandpass** is DC to 180 MHz(-3 dB). Typical applications include 75 ohm Video or DS3/T3 Switching. Input and Outputs buffer amplifiers can be added to the basic switch fabric allowing a broad range of both 75 and 50 ohm impedance signals to be switched.

VDX/32x32-E EXPANSION CHASSIS

This Chassis has all the features of the VDX/32x32 Mainframe but is controlled and powered by a MESA Control Chassis as detailed in the **MESA Bulletin**.

Custom configurations are available on request. Please contact our Technical Sales Department for application assistance.

CONTACT 1-800-346-3117 OR WWW.CYTEC-ATE.COM
FOR TECHNICAL ASSISTANCE

SPECIFICATIONS AND BUFFER OPTIONS

Fig. 2
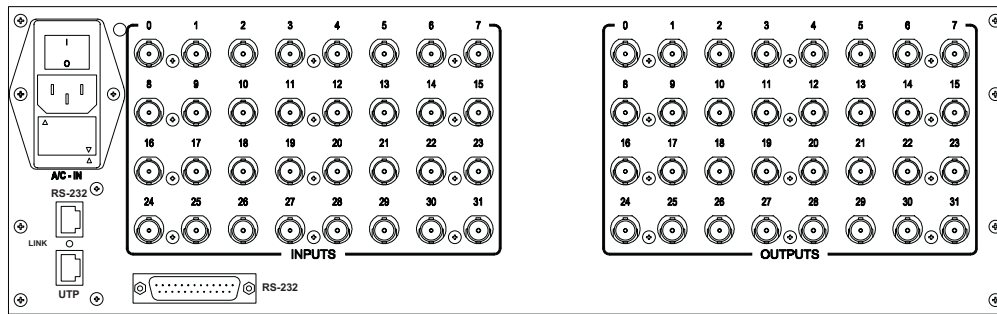
VDX/32x32 Mainframe with RS232 and LAN Control and BNC Signal Connections

VDX SERIES MATRIX

The VDX Series is intended to switch small signal levels in a non-blocking (any input to any output), full fan out (any input to any or all outputs) configurations. The heart of the system is a solid state 32x32 switch fabric. When used without buffer amplifier modules, the system conforms to all of the specifications shown below. When used with input and/or output buffers, the specifications are determined by the buffer stages.

VDX SPECIFICATIONS (75 ohms, no buffers)

Connections	BNC Signal Connections, AC input and Remote Control input are on rear panel shown in **Fig.2**. Alternate signal connectors including SMA, SMB and SMC optionally available.

ENVIRONMENTAL

Operating Temperature	0° to 70° C
Storage Temperature	-25° to 80° C
Humidity	95% RH noncondensing to 30° C

POWER

AC Input	Selectable 100-130 or 200-240 Volts AC, 50-60 Hz.
DC Supply Type	Low Noise Linear
Consumption	150 Watts Maximum for 32x32 Matrix

BANDPASS

Small Signal Flatness	200 MHz (-3dB) for 200 mVpp 0.1dB at 60 MHz
Large Signal Flatness	80 MHz (-2dB) for 2.0 Vpp 0.1dB at 45 MHz
Slew Rate	0.375 V/ns

CROSSTALK / ISOLATION

Crosstalk	-50 dB at 5 MHz -60 dB at 10 MHz Non Adjacent -46 dB at 10 MHz Adjacent Channels
Isolation	-95 dB at 10 MHz

MISCELLANEOUS

Switching Speed	50 ns plus any computer delay
Characteristic Impedance	75 Ohms (unbuffered) 50 Ohms buffered

VDX-2

INPUT and OUTPUT BUFFERS

Optional Buffers are available for all Input and/or Output Channels. These buffers serve up to three different purposes:

1) They transform impedances to allow the solid state switch fabric to be used for systems with other than 75 ohms characteristic impedance.

2) Input Buffers can be used to reduce signals to levels where they can be safely switched by the matrix.

3) Output Buffers can have preset gains to boost signals to required voltages.

A typical buffer is shown schematically in **Fig. 3**. Resistors **Rs** and **Ri** set the input impedance and also attenuate the input signal (if needed), while **Rout** determines the output impedance. The circuit is typically built with one of several standard small signal Op Amps, but custom amplifiers are also possible. The specifications for a typical small signal amplifier are shown below.

BUFFER SPECIFICATIONS

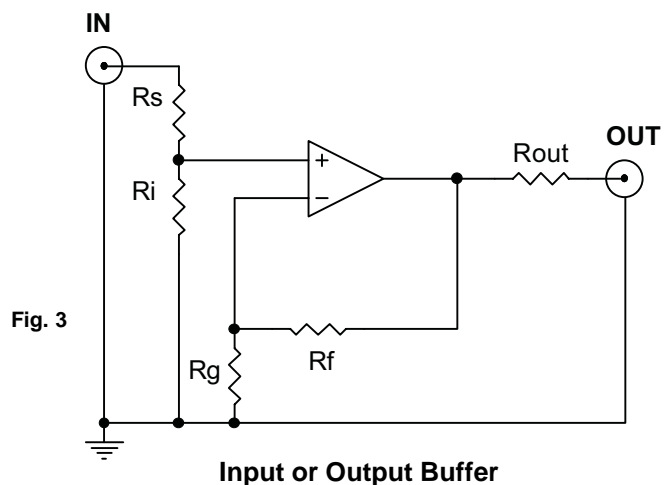|	
Bandpass (-3dB)	175 MHz w/ Vout=2Vpp 165 MHz w/ Vout=5Vpp
Preset Gains (Av)	2 to 16
Output Current	70 mA typical
Rise Time	0.375 V/ns typical

Fig. 3

Input or Output Buffer

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Workmanship and Materials for a period of five years and that all switches are guaranteed for their Rated Operations.

2555 Baird Road, Penfield, New York 14526   (716) 381-4740   FAX (716) 381-0475

VM SERIES
VME AND VXI SWITCH MODULES

The VM Series of Switch Modules are available as either VME size 6U Modules or VXI size B Modules and include Multiplexers, Matrices, Discrete Relays and Coaxial Matrices.

FEATURES INCLUDE:
- **VXI Rev. 1.4 Register based operation.**
- **Status and Control Registers.**
- **Simple BYTE read and write for parallel access to relays.**
- **Status readback from relay coils.**
- **Reed relays include Standard, Low Thermal and Mercury.**
- **Armature relays are available for high power switching.**
- **Solid State matrices for Video switching.**
- **Microwave Switch Modules with bandpass up to 18 GHz.**
- **Software support including program examples and drivers.**

VM/8-4x1 MULTIPLEXERS

This module has 32 two pole relays arranged as eight separate 4x1 multiplexers as shown in **Fig.1**. The 32 pairs of inputs are brought out to two 34 pin header connectors and the 8 pairs of outputs with the submultiplex relay are brought out to a 20 pin header connector.

The multiplexers are available with either Type S, M or LT relays and can be supplied in the following configurations.

Multiplexers	Multipole
8 - 4x1 two pole	4 - 4x1 four pole
4 - 8x1 two pole	2 - 4x1 eight pole
2 - 16x1 two pole	1 - 4x1 sixteen pole
1 - 32x1 two pole	
1 - 64x1 single pole using submultiplexer	

Bandpass of each 4x1 Mux exceeds 200 MHz which is reduced when combined in the larger Multiplexers.

Isolation is 40dB at 10 MHz with 50 ohm terminations.

34 Pin Header   34 Pin Header

| 28–31 | 24–27 | 20–23 | 16–19 | | 12–15 | 8–11 | 4–7 | 0 - 3 |
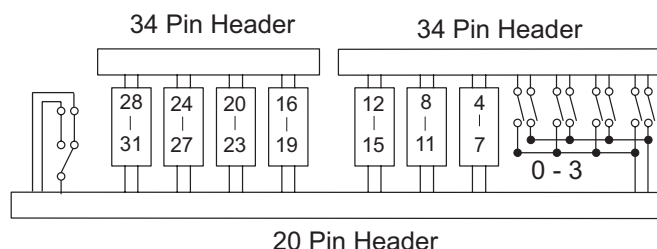
20 Pin Header

Fig.1

VM/32K DISCRETE RELAYS

This module has 32 single pole single throw reed relays with all contacts wired out separately to two 34 pin Header connectors as shown in **Fig.2**.

It is available with either Type S or Type M reed relays.

Insertion Loss is less than 0.1dB at 1 MHz.

Crosstalk is less than 60dB at 200 KHz.

DC Isolation is greater than 10^{10} ohms.

0   15   16   31

34 Pin Header   34 Pin Header
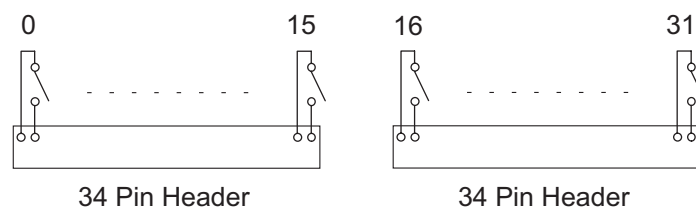
Fig.2

VM/24DRV RELAY DRIVER MODULE

This module has 24 open collector relay drive circuits with diode suppression and current drive capability of 1.8 amp DC. Relay power source can be from the +5 volt or +12 volt supplies on the VME or VXI Chassis backplane or from an external source of up to +50 volts.

There are four driver channels per driver IC with a maximum package dissipation of 3.8 watts at 25°C.

The drives can be wired to relays mounted on a blank area of the circuit board or to three 20 pin connectors on the back panel.

CONTACT 1-800-346-3117 OR WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE

VM/8x4 MATRIX SWITCH MODULE

This module has two 4x4 two wire matrices with Inputs and Outputs brought out to 16 pin Header connectors as shown in **Fig. 3**. The two matrices can be combined as one 8x4 matrix.

16 Pin Headers   16 Pin Headers

Fig. 3

The module is available with either Type S, M or LT relays.
Bandpass is DC to 100 MHz (-3dB).
Crosstalk is less than 60dB at 1 MHz.

VM/8x8-CX COAXIAL MATRIX

This module uses single pole Type S coaxial reed relays in two 4x8 matrix configurations with 50 ohm impedance as shown in **Fig. 5**. The isolation relays form an 8x8 matrix in a way that shortens stub length, increases bandpass and reduces crosstalk. This module is also offered as one 4x8 matrix or one 4x4 matrix.
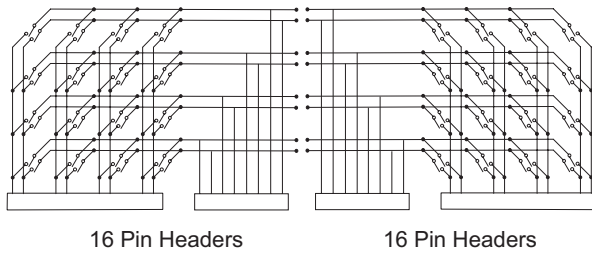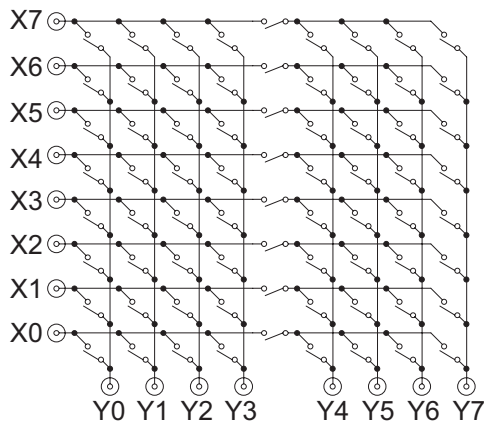
The input and output connectors are SMA or SMB.

Fig. 5

X7 X6 X5 X4 X3 X2 X1 X0

Y0 Y1 Y2 Y3   Y4 Y5 Y6 Y7

Bandpass is DC to 200 MHz (-3dB)
Crosstalk is less than 60dB at 1 MHz.
Insertion Loss is less than 0.2dB at 10 MHz.
VSWR at 10 MHz is 1.07.

VM/V8X8 VIDEO MATRIX

This module is a solid state 8x8 non-blocking matrix as shown in **Fig. 5** with full fanout so that any input can be connected to 8 outputs. Signal impedance is 75 ohms and input and output connectors are SMA.

Gain - Unity   **Impedance** - 75 ohms
Bandpass: **1 input to 1 output** - 90 MHz (-3dB)
             1 input to full fanout - 70 MHz (-3dB)
Crosstalk -60dB at 10 MHz
Max Input Signal - ±5 volt
Max Output Signal - ±1.5 volt

VM/24KCP POWER RELAYS

This module has 24 single pole double throw armature type power relays wired out in groups of 8 relays to 25 pin D type connectors shown in **Fig. 4**.
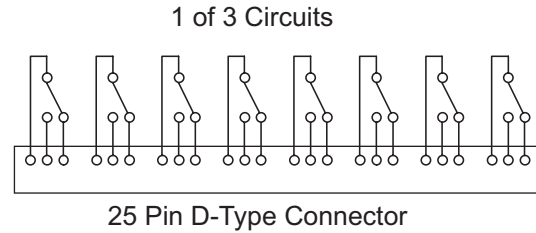
1 of 3 Circuits

25 Pin D-Type Connector   **Fig. 4**

Mechanical life is 10 million operations. Electrical life is 100,000 operations if operated within the following ratings:
Contact Rating AC -2000VA
Contact Rating DC -150W
Maximum Switch Voltage - 380VAC
Maximum. Switch Current - 8 amp
Breakdown Voltage - 1000V RMS
Operate Time - 10msec

VM/MW MICROWAVE MODULE

Modules can be supplied with microwave relays for bandpass from DC to 18 GHz.

Up to three 2x1 relays can be mounted on a single width slot. Other relays are available from 3x1 up to 6x1 multiplexers and are mounted on double or triple slot width depending on the specific requirement.

The relays are available with Fail Safe, Latching or Terminated mode of operation.

Call and discuss your specific application with our Sales Engineers.

REED RELAY SPECIFICATIONS

• **Type S** - Standard Dry Reed Relays.
• **Type M** - Mercury Wetted Reed Relays.
• **Type LT** - Low Thermal Reed Relays.

All relays have a guaranteed life of 100 million operations if operated within the following ratings:

	Type S	Type M	Type LT
Contact Rating	10VA	50VA	10VA
Max. Switch Voltage	200V	500V	100V
Max. Switch Current	0.5A	2.0A	0.2A
Breakdown Voltage	400V	1000V	200V
DC Isolation	10^{10}ohms	10^{10}ohms	10^{12}ohms
Operate Time, less than 1ms		2ms	1ms

OPERATING SPECIFICATIONS

OPERATING TEMPERATURE: 0^0 C to 55^0 C
STORAGE TEMPERATURE: -25^0 C to 80^0 C
HUMIDITY: less than 95% RH
POWER: +5 Volt - less than 1.5A.
             +12 Volt - less than 20mas per reed relay or armature relay.
For Microwave relays, consult our Sales Engineers.

WARRANTY

CYTEC Corp warrants that all products are free from defects in Materials and Workmanship for a period of 5 years, except Microwave Relays which are warranted for 1 year only.

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526 (585) 381-4740 Fax (585) 381-0475

VX SERIES
SWITCHING SYSTEMS
FOR AUTOMATIC TEST, INSTRUMENTATION AND COMMUNICATIONS

The VX Series of low-cost, versatile Switching Systems use a modular concept of Switch Modules, Display Modules and Control Modules which can be assembled into VX/256 Mainframes as Matrices, Multiplexers or Individual Relays.
All units have front panel LED displays and Status feedback of selected relays.
Control Modules are available for IEEE488 Bus, RS232 Serial, 10Base-T Ethernet LAN, and optional Front Panel Manual Controls.

IEEE 488 BUS

RS232 SERIAL

PC I/O PORT

LAN
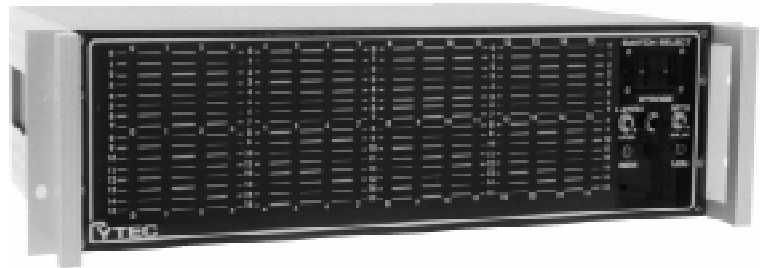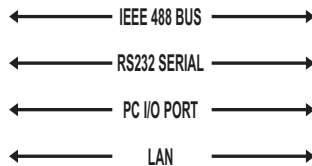
VX/256 Mainframe with Manual Controls

VX/256 MAINFRAMES

The Mainframes are 19" rack mounting units 5.25" high and 12" deep with power supplies and motherboards to accept up to 16 VX Switch Modules, Display Modules and a Control Module. These modules plug into the mainframes so that signal inputs are accessible on the back panel and the LED displays are visible through the translucent front panel.
The Mainframes accept any of the VX Switch Modules.

VX/256-E EXPANSION CHASSIS

These units have the same prewired motherboards as the mainframes but do not have power supplies or control modules. They are powered and controlled from the MESA Control Unit as detailed in the **MESA Bulletin.**

VX/256-W WIRED UNITS

All mainframes and expansion chassis can be supplied in 16" deep chassis with modules wired out to user specified connectors in any required configuration.

CL16 DISPLAY MODULES

One Display Module is required for each Switch Module. It has the controls for selecting and Latching or Unlatching the 16 relays in the Switch Module. Sixteen LEDs in series with the relays give an absolute indication that the relays are energized. The LEDs are visible through the front panel and are a valuable aid in checking the matrix status.
The CL16 also includes Status Feedback to the computer to verify that selected relays are energized by checking the relay drive output.

SWITCH MODULES

Each Switch Module has sixteen relays and each relay can be individually latched or unlatched and the Status displayed by the CL16 Display Module.
The following Switch Modules are available:

VX/4(1X4) MODULE

This versatile module has four 1x4 two pole matrices which can be configured as two 1x8 Matrices or one 1x16 module.

VX/G MODULES

These modules have 16 relays with inputs on header connectors and outputs bussed on the motherboard.
VX16/G2 has 16 two pole relays.
VX16/G3 has 16 three pole relays.
VX16/GC has 16 single pole **Form C** relays.

VX/K MODULES

These modules have 16 individual relays and are not bussed to the motherboard.
VX/KA has 16 single pole **Form A** relays.
VX/KC has 16 single pole **Form C** relays.

VXC MODULES

These modules are high frequency coaxial matrices with **SMA** connectors.
VXC/4x4 has 16 single pole coaxial relays arranged in a 4x4 configuration.
VXC/8x2 has 16 single pole coaxial relays arranged in an 8x2 configuration.

VX/256 CHASSIS

The VX/256 Chassis consist of Mainframes and Expansion Chassis with pre-wired motherboards which accept 16 of the VX Switch Modules and Display Modules.
The motherboards are assembled so that the Switch Module signal connectors are accessible from the chassis back panel and the LEDs are visible through the front panel.
The VX/256 Mainframes have power supplies and are pre-wired for a Control Module.
The VX/256-E Expansion Chassis are powered and controlled from the MESA Control Unit detailed in MESA Bulletin.

VX MATRIX SWITCH MODULE

These modules have 16 two pole relays arranged as four 1x4 matrices as shown in Fig. 1. One side of each matrix is wired to signal connectors and the other side is wired to card edge connectors which plug into the VX/256 Signal Motherboard. The signal connectors available include BNC, 3 pin Header or Screw Terminals.
The modules are available with Type S, M or LT reed relays.

SWITCH MODULE CONFIGURATIONS

The basic Switch Module shown in Fig. 1 includes bus points A, B and C which allows the module to be configured as either a VX/4(1x4), VX/2(1x8) or VX/1x16 Module.
VX/4(1x4) Module has no bussing and configures as **four 1x4** matrices. Allows formation of 4x4 through 64x4 Matrices.
VX/2(1x8) Module is bussed at points A & C to form **two 1x8** matrices. Allows formation of 2x8 through 32x8 Matrices.
VX/1x16 Module is bussed at bus points A, B & C to form **one 1x16** matrix. Allows formation of 1x16 through 16x16 Matrices.
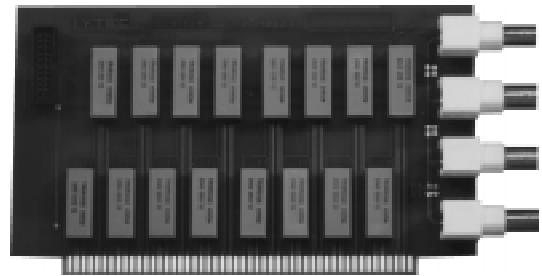
MATRIX CONFIGURATIONS

Several different Matrix configurations can be assembled in the VX/256 Chassis using the three different VX Matrix Switch Modules and by bussing on the Signal Motherboard.
Bandpass is DC to 10 MHz and Isolation is better than -60dB at 1 MHz.

VX/4(1x4) CONFIGURATIONS

Four 16x4 Matrices can be configured without any bussing as shown in **Fig. 2**.
Two 32x4 Matrices can be configured by bussing between Matrices 1 & 2 and between Matrices 3 & 4 in **Fig. 2**.
One 64x4 Matrix can be configured by bussing between Matrices 1, 2, 3 & 4 in **Fig.2**.
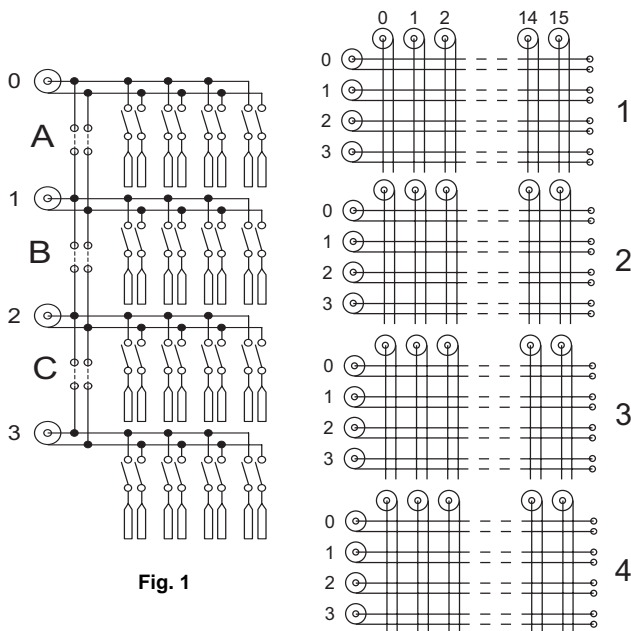
VX/2(1x8) CONFIGURATIONS

Two 16x8 Matrices can be configured as shown in **Fig. 3** without bussing the Motherboard.
One 32x8 Matrix can be configured by bussing between Matrices 1 & 2 in **Fig. 3**.

VX/1x16 CONFIGURATIONS

One 16x16 Matrix can be configured as shown in **Fig. 4** without bussing the motherboard.
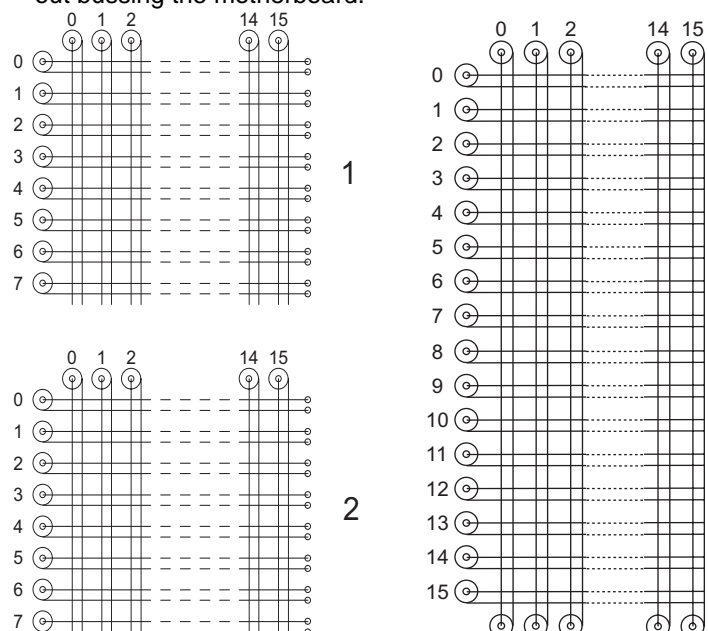
Fig. 1

Fig. 2

Fig. 3

Fig. 4

VX GENERAL PURPOSE MODULES

VX/G SWITCH MODULES

These modules have the inputs of 16 relays wired to header connectors on the rear edge of the module and the outputs wired to the motherboard as shown in **Figs. 5 & 6**.

Plugged into the bussed motherboard, the modules can be wired in configurations of **16x16, 32x8, 64x4, 128x2 or 256x1**.

The following types of modules are available:

VX16/G1 has 16 single pole relays wired to two 20 pin headers as shown in **Fig. 5** and is available with **Type S** or **M** reed relays.

VX16/G2 has 16 two pole relays wired to two 20 pin headers as shown in **Fig. 5** and is available with **Type S, M** or **LT** reed relays.
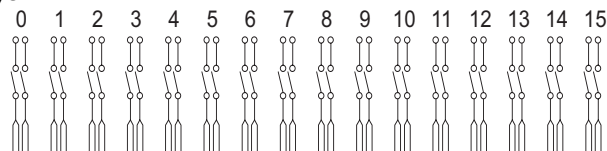
Fig. 5

VX16/G3 has 16 three pole relays wired out to a 50 pin header and is available with **Type S, M**, or **LT** reed switches.

VX16/GC has 16 single pole, **Form C** relays wired out to two 20 pin header connectors as shown in **Fig. 6**.

These modules are available with **Type CS** relays.
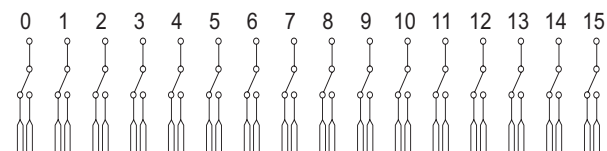
Fig. 6

VXC/4X4 COAXIAL SWITCH MODULE

This module has 16 single pole coaxial relays interconnected by 50 ohm characteristic impedance striplines in a 4x4 matrix configuration as shown in **Fig. 9**. The inputs and outputs are wired out to coaxial connectors on the rear of the module which can be **SMA, SMB** or **Coaxicon**. There are no connections to the motherboard.

Bandpass is DC to 400 MHz (-3dB).

Crosstalk and Isolation are better than 60 dB at 10 MHz.
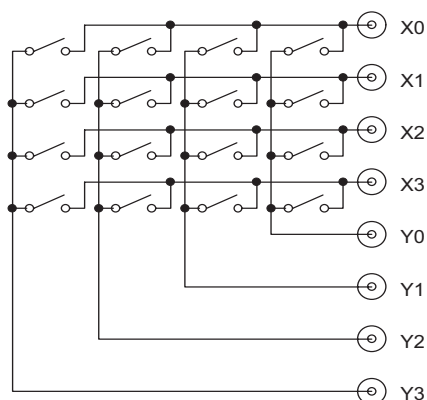
Fig.9

VX/K SWITCH MODULES

These modules have 16 individual relays with both inputs and outputs brought out to header connectors on the rear of the module. There are no connections to the motherboard, and these modules can be used in any combination with other VX modules.

There are two types of modules:

VX/KA has 16 **Form A** relays wired out to two 20 pin header connectors as shown in **Fig. 7**. It is available with both **Type S** or **M** reed switches.

VX/KC has 16 **Form C** relays wired out to a 50 pin header connector as shown in **Fig. 8**. It is available with both T**ype CS** or **CM** reed switches.
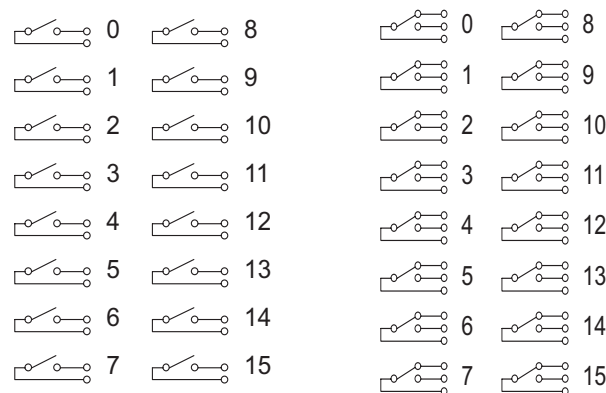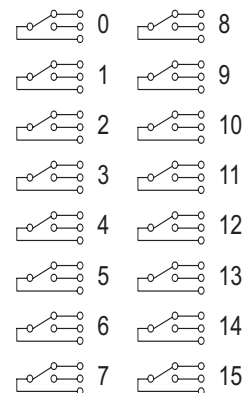
Fig. 7   **Fig. 8**

VXC/8X2 COAXIAL SWITCH MODULE

This module has 16 single pole coaxial relays interconnected by 50 ohm characteristic impedance striplines in an 8x2 matrix configuration as shown in **Fig. 10**.

The inputs are wired out to **SMA** connectors on the rear of the module.

The outputs are switched through isolation relays to two **SMA** connectors on the back panel and to the card edge connector which plugs into a coaxial motherboard.

Bandpass is DC to 200 MHz (-3dB).

Crosstalk and Isolation are better than 60 dB at 10 MHz.

When plugged into the coaxial motherboard, the bandpass is dependent on matrix size due to the stub length, and in a 128x2 matrix, the bandpass is 50 MHz.
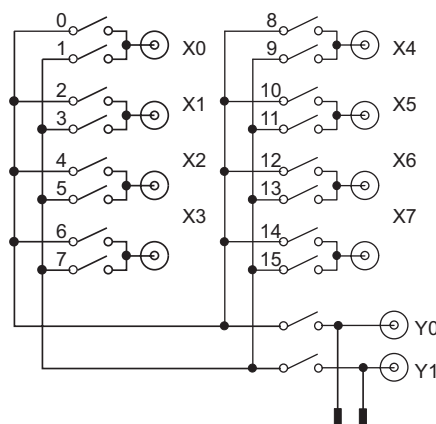
Fig. 10

GX GROUP SWITCH

VX16/G2 & VX16/G3 Switch Modules can be used in the GX/16 Group Switch Chassis to switch signals in groups of up to 48 wires in up to a 16x1 Multiplexer configuration. For more information see GX Bulletin.

VX SERIES RELAY SPECIFICATIONS

The relays use high reliability reed switches with a guaranteed life of 100 million operations when used within the following specifications:

Type S and CS Standard switches are for general purpose instrumentation level signals.

Type M and CM Mercury switches are for higher power switching.

Type LT Low Thermal switches have offset of less than one microvolt for very low signal level measurements.

SPECIFICATIONS	S	M	LT	CS	CM
Contact Rating VA	10	50	10	3	30
Switching Voltage DC	200	500	100	200	350
Switching Current DC	.5A	1.0A	.25A	.25A	1.0A
Carrying Current DC	1.0A	2.0A	1.0A	1.0A	2.0A
Breakdown Voltage DC	400	1000	400	200	1000
Operate Time MSec	1	2	1	1.5	3

GENERAL SPECIFICATIONS

DIMENSIONS - 19" Rack Mounting, 5.25" high and 12" deep.
WEIGHT - With full complement of Modules - 25 lbs.
POWER - 100-130 Volts AC or 200-240 Volts AC 50-60 Hz, 100 VA.
ENVIRONMENT - Operating at 0^0 C to 50^0 C.
Storage at -25^0 C to 65^0 C.

ACCESSORIES

MATING CONNECTORS

J3 - Three pin crimp type header connector.
J3ST - Three screw terminal type header connector.
J20-R - Twenty pin ribbon type header connector.
J20-C - Twenty pin crimp header connector.
**J50-R** - Fifty pin ribbon cable type header connector.
J50-C - Fifty pin crimp type header connector.

CABLES

CBL-0.5 IEEE488 Cable .5 meters long.
CBL-1 IEEE488 Cable 1 meter long.
CBL-2 IEEE488 Cable 2 meters long.
RS-1 RS232 Cable 2 meters long.
Cables and wired chassis can be built to customers specific requirements. Please contact our Sales Staff for more information.

CHASSIS SLIDES

CHS-1 Pairs of 19" rack mounting chassis slides with 15" travel.

CABINETS

Portable cabinets with handles for 19" rack mounted units with 10.5" panel spaces and 21" depth.

CONTROL MODULES

The VX Mainframes can be computer controlled via the modules listed below. Each Control Module selects any switchpoint and Latches, Unlatches and returns Status of that point.

IF-1 PARALLEL PORT

This module requires 14 individual TTL level binary lines from the controlling computer. These select Switch and Mode, Strobe the selected command and return switch point Status.

IF-5 IEEE488/RS232

This module combines both the IEEE488 Talk/Listen and the RS232 features detailed in the AP-5 Bulletin.

IF-6 LAN INTERFACE

This module allows control via a 10Base-T Ethernet LAN using TCP/IP protocol detailed in the AP-5 Bulletin.

MANUAL CONTROLS

M/256 MANUAL CONTROL

This manual control consists of thumbwheels and toggle switches on the front panel for switchpoint and mode selection. A Strobe pushbutton enters the data.
These controls can be "locked out" by the computer.

VMCS VIRTUAL MANUAL CONTROL SOFTWARE

This Software displays a full Graphical User Interface (GUI) on the controlling computer. The operator controls the Mainframe with simple mouse point-and-click operations. The software can also be used to control the unit over a LAN.
Windows based software is free with any purchase.
A demo version is available on our web site at:
  http://www.cytec-ate.com/soft.htm

SOFTWARE

Drivers and Sample Programs are available for the most common programming languages. These check the entire system by cycling through all switches, sequentially latching and unlatching each switch while checking Status.

CUSTOM SYSTEMS

CYTEC Corp. can build Group Switches using a variety of Switch Modules, Connectors or mixtures of signal types. If you do not see what you need for your application, please contact us and give us the opportunity to recommend a solution.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Material and Workmanship for a period of 5 years and that all switches are guaranteed for their Rated Operations.

CONTACT 1-800-346-3117 OR WWW.CYTEC-ATE.COM FOR TECHNICAL ASSISTANCE

VXI
SWITCHING SYSTEMS

LOW COST SOLUTIONS FROM THE SWITCHING SPECIALISTS.
• MATRICES • MULTIPLEXERS • POWER RELAYS
• COAXIAL MATRICES • CUSTOM MODULES.

Full

Assortment of

C Size VXI

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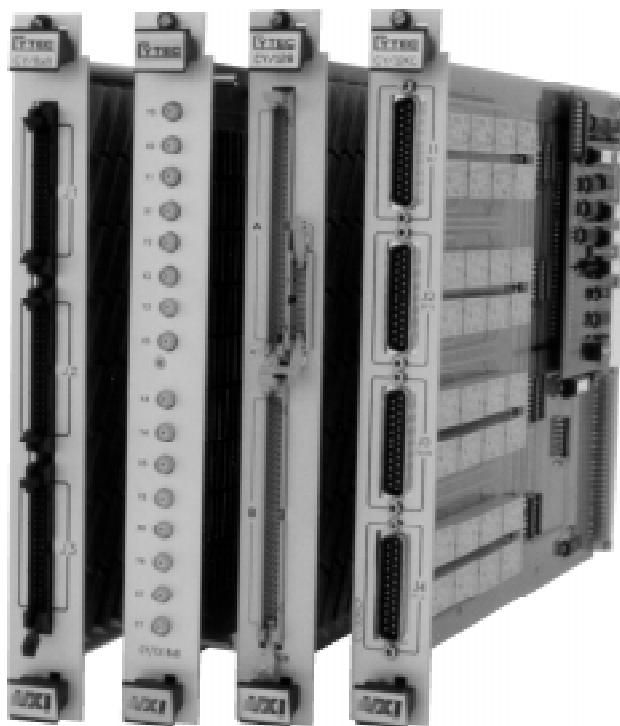
B Size

Modules and

VME Modules

also available

Member of the

VXI
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FULL PRODUCT CATALOG,
CONTACT
1-800-346-3117 or
www.cytec-ate.com or
sales@cytec-ate.com**

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526

CYTEC CORP.

CY SERIES
VXI C-SIZE SWITCH MODULES

The CY Series are low cost C-Size VXI Bus Switch Modules that utilize both Message and Register based operation. Available modules include Multiplexers, Matrices, Microwave Switches, Individual Form A and Form C Relays, Driver Modules, 50 Ohm Coaxial, Solid State and ECL Matrices.

FEATURES INCLUDE:

- **FULL FIVE YEAR WARRANTY**
- **STATUS of individual relays monitored at the relay drives.**
- **HIGH RELIABILITY Type S Standard and Type M Mercury Wetted Reed Relays with a guaranteed life of 100 million operations.**
- **LOW THERMAL Relays with offsets less than 1 μvolt.**
- **MICROWAVE Switches with a Bandpass of DC to 18 GHz; 26 GHz optionally available.**
- **HIGH FREQUENCY 50 ohm impedance 8x8 Coaxial Matrix with 200 MHz bandpass.**
- **HIGH POWER Switch Modules with 32 Form C Armature Relays with 150 W or 2000 VA rating.**
- **MULTIPLEXERS with up to 128 switch points.**
- **HIGH DENSITY BIDIRECTIONAL MATRICES up to 16x8 or 62x2 configurations.**
- **"K" MODULES with 64 individual Form A or Form C relays.**
- **SOLID STATE 48x48 Matrices.**
- **ECL 16x16 Differential Pair Matrix.**
- **BUFFER Amplifier Modules with unity gain for impedance matching.**
- **DIFFERENTIAL INSTRUMENTATION Amplifiers with preset gains.**
- **DRIVER MODULES with individual current sourcing or sinking drives.**

SOFTWARE

Drivers and/or sample programs are available in the most common programming languages. Please consult our expert Sales Engineers.

Member of the VXI Plug and Play Alliance..
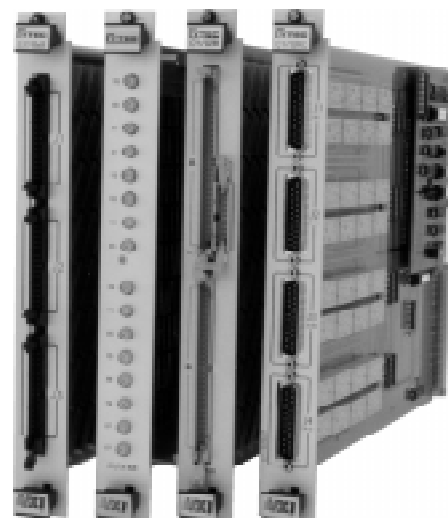
GENERAL SPECIFICATIONS

VXI Revision	1.4
Logical Address	Per DIP Switch Setting
Radiated Emissions	Per VXI Specification
Conducted Emissions	Per VXI Specification

ENVIRONMENTAL

Operating Temperature	0° to 55^oC
Storage Temperature	-25° to 80^oC
Humidity	Less than 95% RH no condensation to 30^oC
Cooling	$<10^o$C rise w/air flow 1.5 L/sec & dP = 0.04 mm H_2O

WARRANTY

CYTEC Corp. warrants that all products are free from defects in workmanship and materials for a period of 5 years. Reed relays are guaranteed for 100 million operations when used within their published specifications. However, Microwave switches are warranted for 1 year.

FOR TECHNICAL ASSISTANCE CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM

CY SERIES RELAY SPECIFICATIONS

- **Type S** - Standard Dry Reed Relays.
- **Type M** - Mercury Wetted Reed Relays.
- **Type LT** - Low Thermal Reed Relays.
- **Type P** - Armature Power Relays.
- **Type A** - Instrumentation Level Signal Armature Relays.

Relays have the following guaranteed lifetimes when operated within the specified operating parameters.

Relay Type	S	M	LT	P	A
Min. Life - Mechanical	10^8	10^8	10^8	10^7	10^8
Min. Life - Full Load*	10^8	10^8	10^8	2×10^5	2×10^5
Contact Rating VA	10	50	10	2000	30
Switch Voltage	200V	500V	100V	380V	110V
Max. Switch Current	0.5A	2.0A	0.2A	8A	1.0A
Max. Carry Current	1.0A	2.0A	1.0A	10A	1.0A
Breakdown Voltage	400V	1000V	200V	1000V	750V
Operate Time	<1ms	<2ms	<1ms	<15ms	<3ms
DC Isolation - Ohms	10^{11}	10^{11}	10^{12}	10^9	10^9

*Load is purely resistive

CY SERIES MODEL OVERVIEW

CYTEC currently offers the following Models/Configurations:
Relay Modules (Note: All Relay Modules are bidirectional.)

- **CY/128** - These are built with 64 two-pole reed relays. Internal Pin Jumpers permit a variety of user-defined configurations, ranging from eight individual 8x1 two-pole multiplexers to one 128x1 single pole mux.
- **CY/8x8 -** This 8 Input/8 Output Matrix Switch Module is available with either single or two pole reed relays.
- **CY/16x8 -** This is a 16 Input/8 Output Matrix that is built with Type A armature relays and is used for switching instrumentation level signals.
- **CY/64x2 -** This holds 128 single pole reed relays arranged as eight individual 8x2 matrices. Many other configurations are possible, including the "standard" 64x2.
- **CY/64K -** This provides 64 individual Form A (NO) Reed Relays.
- **CY/64KC -** This supplies 64 separate Form C (NO/COM/NC) Type A Instrumentation Armature Relays.
- **CY/32KCP -** This is built with 32 Individual Form C Type P Power Relays for high power/current applications.
- **CY/CX -** This is a 50 ohm impedance 8x8 matrix which is designed to switch RF signals. Bandpass (-3dB) is 200 MHz.
- **CY/G and CY/M -** These switch microwave signals (DC-18 GHz). These one, two or three slots modules are built to the user's specifications and hold the CXR/1G and CXM Series Switch Modules.

Solid State Modules

- **CY/48x48 -** This 48x48 single pole matrix designed to switch ±5 volt signals. Bandpass is DC to 1 MHz, and path on resistance is 60 ohms.
- **CY/16x16ECL -** This provides a 16x16 nonblocking matrix for switching Differential ECL up to 1.2GBPS.
- **CY/IO-48 -** This holds 48 unity gain impedance matching buffer amplifiers.
- **CY/INST-48 -** This holds 48 precision differential input op amps. These have high input and low output impedances and make an ideal buffer into the CY/48x48 Solid State VXI Matrix.

MICROWAVE RELAYS

These **CY/G** and **CY/M** Modules are available as individual relays or as multiplexers or wired in a variety of different configurations including matrices. Please contact our Sales Department for information.

AD DATA SWITCH MODULES

CYTEC Corp is offering support, repair, service and replacement of AD Data VXI Modules.

230114-111 - Single pole, Standard Reed Relays. 64 SPST Switches; 64 Discrete Switches, 0.5 amp.

230114-112 - Single pole, Mercury Relays, 64 SPST Switches; 64 Discrete Switches, 2.0 amp.

230115-111 - Single pole, Standard Reed Relays, 64x1 Multiplexer Switch 0.5 amp.

230115-112 - Single pole, Mercury Relays, 64x1 Multiplexer Switch 2.0 amp.

230115-121 - Double pole, Standard Reed Relays, 64x1 Multiplexer Switch 0.5 amp.

230115-122 - Double pole, Mercury Relays, 64x1 Multiplexer Switch 2.0 amp.

230115-123 - Double pole, Low Thermal Relays, 64x1 Multiplexer Switch.

230116-111 - Single pole, Standard Reed Relays, 16x4 Matrix Switch 0.5 amp.

230116-112 - Single pole, Mercury Relays, 16x4 Matrix Switch 2.0 amp.

230116-121 - Double pole, Standard Reed Relays, 16x4 Matrix Switch 0.5 amp.

230116-122 - Double pole, Mercury Relays, 16x4 Matrix Switch 2.0 amp.

230126-123 - Double pole, Low Thermal Relays, 16x4 Matrix Switch 0.5 amp.

230117-111 - Single pole, Standard Reed Relays, Registered based 96 (1x1) Switch Module 0.5 amp.

230117-112 - Single pole, Mercury Relays, Registered based 96 (1x1) Switch Module 2.0 amp.

230118-111 - Single pole, Standard Reed Relays, Registered based 24 (4x1x1) Switch Module 0.5 amp.

230118-112 - Single pole, Mercury Relays, Registered based 24 (4x1x1) Switch Module 2.0 amp.

230119-111 - Single pole, Standard Reed Relays, 6 (1x4) Coaxial 1 Gigahertz Switch Module.

230120-115 - Single pole, Armature Relays, 20 SPST 10 amp, Register-based Power Switch Module.

230120-125 - Double pole, Armature Relays, 20 SPST or 10 DPST 10 amp, Register-based Power Switch Module.

230122-111 - Single pole, Standard Reed Relays, Registered based 12 (4x1) and 48(1x1) Switch Module 0.5 amp.

230122-112 - Single pole, Mercury Relays, Registered based ARINC 608A 2 (4x1x1) and 48(1x1) Form A 2A Switch Module.

230131-123 - Double pole, Low Thermal Relays, Registered based ARINC 608A Form A Resource Distributor Switch Module.

230132-123 - Double pole, Low Thermal Relays, Registered based ARINC 608A 2 (16x4) 4 wire/channel Form A Bus Matrix Input Switch Module.

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   FAX (585) 381-0475

CY/128 MULTIPLEXER
VXI C-SIZE SWITCH MODULE

The CY/128 is a bidirectional reed relay multiplexer and is used in general purpose switching applications. The module is designed with flexibility in mind, and a variety of different configurations are available. This allows the users to choose the configuration which most closely matches their requirements. All CYTEC VXI Modules use both Message and Register based operation.

DETAILED DESCRIPTION

The CY/128 Multiplexer holds eight individual 8x1 two-pole multiplexers and four single pole submultiplexer relays. Pin jumpers can be installed to interconnect the individual multiplexers, allowing the following configurations to be created:

- **Eight - 8x1** Two-Pole Multiplexers
- **Four - 16x1** Two-Pole Multiplexers
- **Two - 32x1** Two-Pole Multiplexers
- **One - 64x1** Two-Pole Multiplexer
- **One - 128x1** Single Wire Multiplexer using two Submultiplexer Relays
- **Two - 64x1** Single Wire Muxes using four Submux Relays
  One - 32x1 Four Wire Multiplexer
- **One - 16x1** Eight Wire Multiplexer
- **One - 8x1** Sixteen Wire Multiplexer
-

Any number of relays can be energized at one time, and the status of all relays may be read at any time.

AVAILABLE MODELS

- **CY/128-S** with Type S Standard Dry Reed Relays
- **CY/128-M** with Type M Mercury Wetted Reed Relays
- **CY/128-LT** with Low Thermal Offset Reeds

CONNECTORS

- Two 64 Pin Headers (128 Individual "Inputs")
- One 20 Pin Header (Eight Multiplexer and four Submux "Outputs")
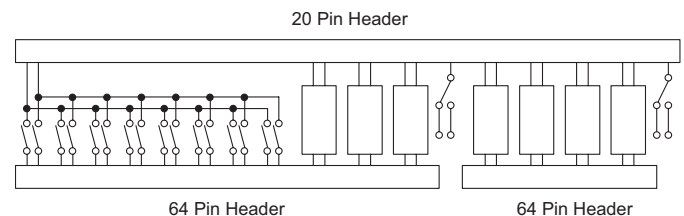
Member of the VXI Plug and Play Alliance..

20 Pin Header

64 Pin Header   64 Pin Header

GENERAL SPECIFICATIONS

Power	**+5 Volts**	less than 1.0 Amp
	+12 Volts	20 mA per energized relay
Bandpass (8x1)		DC to 80 MHz (-3dB)
Insertion Loss		less than 0.2dB at 10 MHz
Isolation/Crosstalk		100 kHz - 80dB
		1 MHz - 60dB
		10 MHz - 40dB
DC Isolation		Greater than 10^{10} ohms

REED RELAY SPECIFICATIONS

- **Type S** - Standard Dry Reed Relays.
- **Type M** - Mercury Wetted Reed Relays.
- **Type LT** - Low Thermal Reed Relays.

	Type S	Type M	Type LT
Contact Rating	10VA	50VA	10VA
Max. Switch Voltage	200V	500V	100V
Max. Switch Current	0.5A	2.0A	0.2A
Breakdown Voltage	400V	1000V	200V
Operate Time, less than	1ms	2ms	1ms
DC Isolation - Ohms	10^{11}	10^{11}	10^{12}

WARRANTY

CYTEC Corp. warrants that all products are free from defects in workmanship and materials for a period of 5 years. Reed relays are guaranteed for 100 million operations when used within their published specifications.

FOR TECHNICAL ASSISTANCE CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   FAX (585) 381-0475

CY/64x2 SINGLE POLE MATRIX
VXI C-SIZE SWITCH MODULE

The CY/64x2 is a bidirectional reed relay matrix and is designed for general purpose switching applications.   The module can be configured in a variety of different ways. The users can specify the configuration which most closely matches their requirements. All CYTEC VXI Modules use both Message and Register based operation.

DETAILED DESCRIPTION

The CY/64x2 Matrix contains 128 single pole reed relays arranged as eight banks of 8x2 matrices. These banks may be used individually or combined via internal pin jumpers to form larger Nx2 matrices. External wiring added by the user provides many other configurations, such as two 16x4 matrices or a single 32x4. Any number of relays may be closed simultaneously, and the status of all relays may be read at any time.

CY/64x2-S

IN 0   IN 1   IN 63   OUT 0 OUT 1
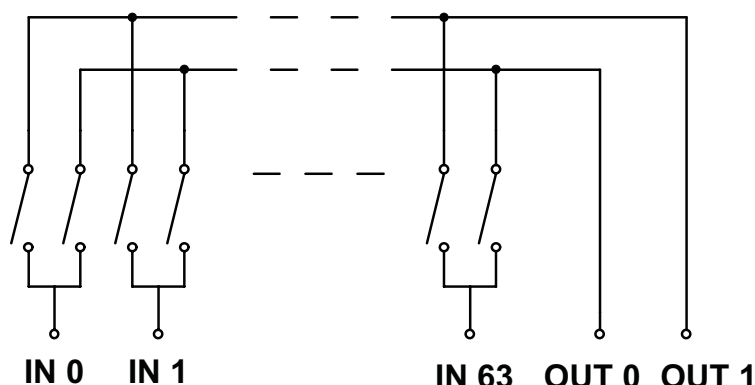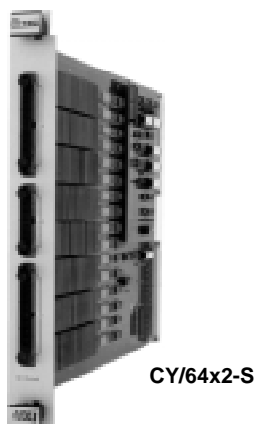
AVAILABLE MODELS

- **CY/64x2-S** with Type S Standard Dry Reed Relays.
- **CY/64x2-M** with Type M Mercury Weed Reed Relays.

CONNECTORS

- Two 34 Pin Headers (128 Individual "Inputs")
- One 20 Pin Header (16 total "Outputs" - one from each of eight 8x2 matrices.)

RELAY SPECIFICATIONS

	Type S	Type M
Contact Rating	10VA	50VA
Max. Switch Voltage	200V	500V
Max. Switch Current	0.5A	2.0A
Max. Carry Current	1.0A	2.0A
Breakdown Voltage	400V	1000V
Operate Time, less than	1ms	2ms
DC Isolation - Ohms	10^{12}	10^{12}

SPECIFICATIONS

POWER   +5 Volts, less than 1.2 Amp
                                    +12 Volts, 25 mA per relay
BANDPASS   DC to 50 MHz (-3dB)
                                    - One 8x2 Bank
ISOLATION/CROSSTALK   <-50 dB at 10 MHz

WARRANTY

CYTEC Corp. warrants that all products are free from defects in workmanship and materials for a period of 5 years. Reed relays are guaranteed for 100 million operations when used within their published specifications.

Member of the VXI Plug and Play Alliance..

FOR TECHNICAL ASSISTANCE CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740 FAX (585) 381-0475

CY/64K & CY/64KC

VXI C-SIZE INDIVIDUAL RELAY SWITCH MODULES

Each of these VXI Switch Modules provides 64 individual switch points. The CY/64K supplies 64 Form A reed relays, while the CY/64KC furnishes 64 Form C general purpose armature relays. Any number or relays may be closed simultaneously and relay status may be read at any time. All CYTEC products utilize both Register and Message based operation.

DETAILED DESCRIPTION

• **CY/64K** holds 64 separate single pole Form C Type S Standard or Type M Mercury reed relays. Each contact set is individually wired to 34 pin front panel connectors.

• **CY/64KC** is built with 64 individual high sensitivity, low thermal offset single pole Form C Type A armature relays for switching instrumentation level signals. The Normally Open, Normally Closed and Common contacts of all relays are wired out to 50 pin header connectors. Thermal Offsets are less than five microvolts.
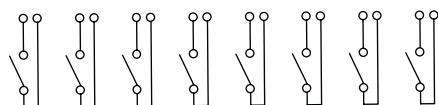
Form A Relays - CY/64K
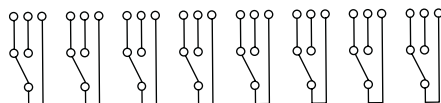
Form C Relays - CY/64KC
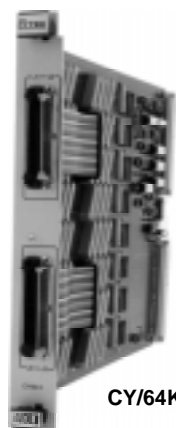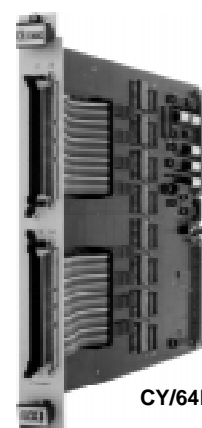
CY/64K   CY/64KC

AVAILABLE MODELS

• **CY/64K-S -** Form A Type S Standard Reed Relays
• **CY/64K-M -** Form A Type M Mercury Reed Relays
• **CY/64KC -** Form C Type A Armature Relays

CONNECTORS

• **CY/64K-** Four 34 Pin Header Connectors
• **CY/64KC -** Four 50 Pin Header Connectors

 Member of the VXI Plug and Play Alliance..

WARRANTY

CYTEC Corp. warrants that all products are free from defects in workmanship and materials for a period of 5 years. Reed relays are guaranteed for 100 million operations when used within their published specifications.

SPECIFICATIONS

POWER	+5 Volts, less than 1.2 Amp
CY64/K	+12V, 15 mA per energ. relay
CY64/KC	+12V, 20 mA per energ. relay
BANDPASS	DC to 40 MHz (-3dB)
INSERTION LOSS	less than 0.1 dB at 1 MHz
ISOLATION/CROSSTALK	less than -40 dB at 1 MHz

RELAY SPECIFICATIONS

	Type S	Type M	Type A
Contact Rating	10VA	50VA	30VA
Max. Switch Voltage	200V	500V	110V
Max. Switch Current	0.5A	2.0A	1.0A
Max. Carry Current	1.0A	2.0A	1.0A
Breakdown Voltage	0.5A	2.0A	1.0A
Operate Time, less than	1ms	2ms	3ms
Lifetime, Mechanical	10^8	10^8	10^8
Lifetime, Full Load	10^8	10^8	$2x10^5$

FOR TECHNICAL ASSISTANCE CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   FAX (585) 381-0475

CY/64DRV RELAY/SOLENOID DRIVER MODULE
CY/32KCP FORM C POWER SWITCH MODULE

CYTEC's CY/64DRV VXI C-Size Driver Module is built with 64 individually address-able current sourcing or sinking drives and is designed to power external loads such as relays or solenoids.   The CY/32KCP has 32 Form C Power Relays that can switch up to 8 A of current and 150 watts DC or 2000 watts AC.

CY/64 DRV C-SIZE DRIVER MODULE

This module has 64 individually controlled drives and is built with either current sourcing or sinking ICs. These modules are typically used to drive solenoids or relays located exter-nal to the VXI Module.   Each drive channel is an open col-lector and has integral diode suppression. The drives can be wired to the VXI Chassis' internal power supply busses or to an external source.

The **CY/64DRV** is configured via an internal DIP Switch to furnish one of eight different operational modes, supplying either 64 randomly controllable drives, one of four different multiplexing modes or one of three different group switch types. The use of any mode is determined by the switching application. Drive status (on/off) can be verified by the con-trolling computer at any time.

AVAILABLE MODELS

• **CY/64DRV-SNK** 64 Channel Current Sinking Driver
• **CY/64DRV-SRC** 64 Channel Current Sourcing Driver

CONNECTORS

• Internal 14 Pin Headers - wired out to external loads

CY/64DRV SPECIFICATIONS

Control Power	+5 Volts, 2.1 A Max.
	+12 Volts, 0.2A Max.
	(not including relay driver)

Drive Power	Source	Sink
Max. Voltage	80 VDC	50 VDC
Max. Current per Driver	350 mA	400 mA
Max. Current per IC Package	1 Amp	1 Amp

CY/32KCP POWER SWITCH MODULE

This module is built with 32 individually controllable Form C Armature type Power Relays. The Normally Open, Normally Closed and Common contacts of each relay are individually wired out to three separate pins on a "D" style connector as shown below. Any number of relays may be closed simulta-neously, and the status of all relays may be read at any time by the controlling computer.
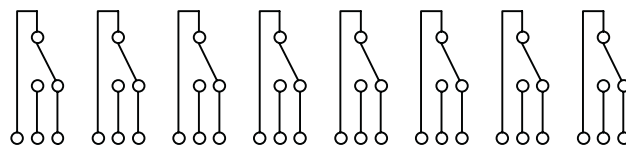
25 Pin D sub Connector

AVAILABLE MODELS

• **CY/32KCP-** 32 Form C Power Relays Switch Module

CONNECTORS

• Four 25 Pin D subs

CY/32KCP SPECIFICATIONS

Power	+5 V, 1.2 Amp. Max.
	+12 V, 25 mA per ener. relay

TYPE P RELAY RATINGS

Switching Power	2000VA, 150W
Switching Voltage	380VAC
Switching Current	8 Amp.
Breakdown Voltage	1200 VRMS
Operate Time	10 mSec. Max.
Mechanical Life	10^7 Operations

Member of the VXI Plug and Play Alliance..

WARRANTY

CYTEC Corp. warrants that all products are free from de-fects in workmanship and materials for a period of 5 years.

FOR TECHNICAL ASSISTANCE CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   FAX (585) 381-0475

CY/CX COAXIAL MATRIX
VXI C-SIZE SWITCH MODULE

The CY/CX Module is a high frequency 50 ohm impedance coaxial matrix with bandpass of DC to 200 MHz.

The matrix is bidirectional and non-blocking, switching any one input to one output with coaxial dry reed relays which are rated at 10VA.

Standard input and output connectors are SMA with SMBs optionally available.

MATRIX CONFIGURATIONS

The basic module has two separate 8x4 matrices which can be supplied as either one 8x8 or one 16x4 matrix.

CY/CX-2(8x4) - This has two individual **8x4** matrices as shown in **Fig. 1**. Each matrix has a bandpass from **DC to 200 MHz (-3dB)** with crosstalk of **-40dB at 100 MHz**.

CY/CX-8x8 - The two **8x4** matrices are interconnected by isolation relays shown in **Fig. 1** to form an **8x8** matrix. The relays also serve to reduce stub length and maintain bandpass from **DC to 170 MHz** with crosstalk of **-40dB at 100 MHz**.

CY/CX-16x4 - The two **8x4** matrices are interconnected by additional isolation relays to form a **16x4** matrix. The relays also serve to reduce stub length and maintain bandpass from **DC to 170 MHz** with crosstalk of **-40dB at 100 MHz**.
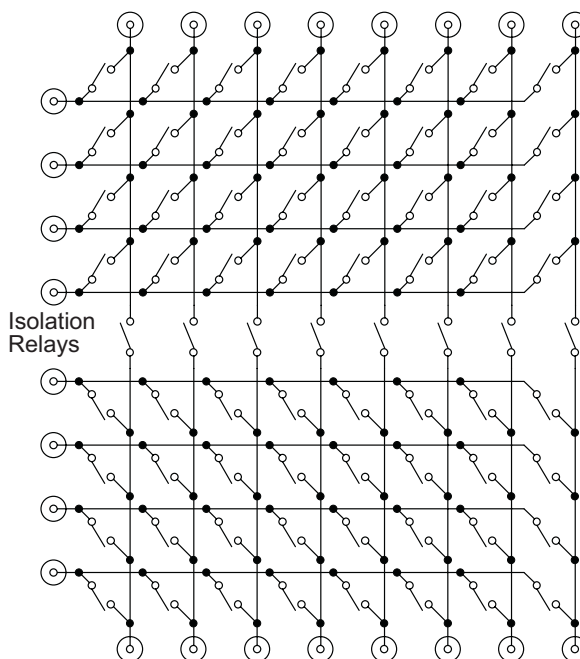
Isolation Relays

REED RELAY SPECIFICATIONS

	Type S
Contact Rating	10VA
Maximum Switching Voltage	200V
Maximum Switching Current	0.5A
Breakdown Voltage	400V
Operate Time, less than	1ms
DC Isolation - ohm	10^{12}
Capacitance across reeds	0.1pF

Member of the VXI Plug and Play Alliance..

GENERAL SPECIFICATIONS

Power	**+5 Volts**	less than 1.2 Amp
	+12 Volts	20 mA per energized relay

WARRANTY

CYTEC Corp. warrants that all products are free from defects in workmanship and materials for a period of 5 years. Reed relays are guaranteed for 100 million operations when used within their published specifications.

FOR TECHNICAL ASSISTANCE CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM

CYTEC CORP.

2555 Baird Road, Penfield, New York 14526   (585) 381-4740   FAX (585) 381-0475

CY/8x8 REED RELAY MATRIX
VXI C-SIZE GENERAL PURPOSE SWITCH MODULE

The CY/8x8 is a general purpose, bidirectional reed relay matrix.   It is a true non-blocking matrix, and each input can be connected to one, many or all outputs concurrently.   All CYTEC VXI Modules utilize both Message and Register based operation.

DETAILED DESCRIPTION

The CY/8x8 supplies two individual 8x4 matrices. These can be interconnect externally by the user to provide one 8x8 or one 16x4 matrix. This VXI Switch Module is built with 64 Reed Relays and is available in either single or two pole versions, and with Type S Standard or Type M Mercury reeds. It is also available as a two pole matrix with Type LT Low Thermal reeds. Any number of relays can be energized concurrently, and the status of all relays may be read at any time.

AVAILABLE MODELS

• **CY/8x8-1S** - Single Pole Type S Standard Reed Relays

• **CY/8x8-1M** - Single Pole Type M Mercury Wetted Reeds

• **CY/8x8-2S -** Two Pole Type S Standard Reeds

• **CY/8x8-2M -** Two Pole Type M Mercury Wetted Reeds

• **CY/8x8-LT -** Two Pole Low Thermal Reed Relays

CONNECTORS

• Three 34 Pin Headers

REED RELAY SPECIFICATIONS

• **Type S** - Standard Dry Reed Relays.
• **Type M** - Mercury Wetted Reed Relays.*
• **Type LT** - Low Thermal Reed Relays.

	Type S	Type M	Type LT
Contact Rating	10VA	50VA	10VA
Max. Switch Voltage	200V	500V	100V
Max. Switch Current	0.5A	2.0A	0.2A
Breakdown Voltage	400V	1000V	200V
Operate Time, less than	1ms	2ms	1ms
DC Isolation - Ohms	10^{11}	10^{11}	10^{12}

* Must be operated in vertical position
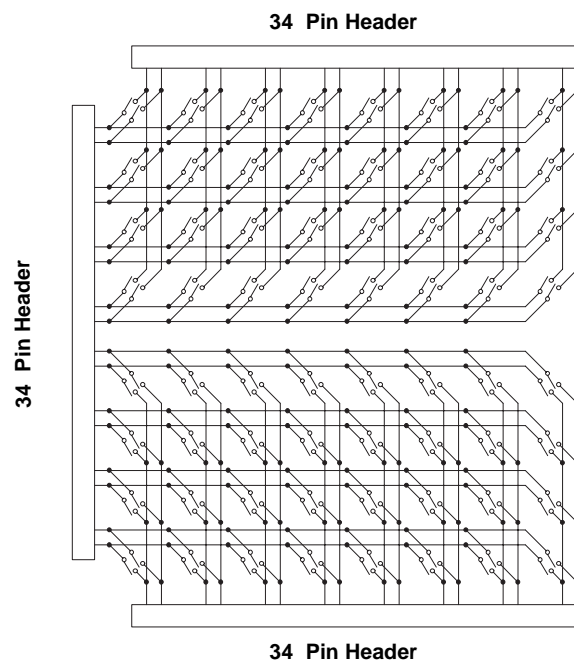
34 Pin Header

34 Pin Header

34 Pin Header

GENERAL SPECIFICATIONS

Power	+5 Volts	less than 1.0 Amp
	+12 Volts	20 mA per energized relay
Bandpass		DC to 80 MHz (-3dB)
Insertion Loss		less than 0.2 dB at 10 MHz
Isolation/Crosstalk		100 kHz - 80 dB
		1 MHz - 60 dB
		10 MHz - 40 dB
DC Isolation		Greater than 10^{10} ohms

WARRANTY

CYTEC Corp. warrants that all products are free from defects in workmanship and materials for a period of 5 years. Reed relays are guaranteed for 100 million operations when used within their published specifications.

Member of the VXI Plug and Play Alliance..

FOR TECHNICAL ASSISTANCE CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM

YTEC CORP.

CY/16x8 ARMATURE RELAY MATRIX
VXI C-SIZE GENERAL PURPOSE SWITCH MODULE

The CY/16x8 is a two pole, bidirectional armature relay matrix that is used to switch instrumentation level signals.   It is a true non-blocking unit, and each input can simultaneously be connected to one, many or all outputs.   All CYTEC VXI Switch Modules utilize both Message and Register based operation.

DETAILED DESCRIPTION

The CY/16x8 is built with 128 two pole Type A Armature Relays and is designed to be used for switching instrumentation level signals. The relays are organized as sixteen rows in the Y direction and eight columns in the X direction. All switching paths are two wires with integral grounds located between all path pairs. Status checking of any input reports all connected outputs, and any number of relays can be energized at one time.

CONNECTORS

• Three 20 Pin Headers

TYPE A ARMATURE RELAY SPECIFICATIONS

	Type A
Contact Rating	30W, 62.5VA
Maximum Switched Voltage	110VDC, 125VAC
Maximum Switched Current	1.0A
Breakdown Voltage	750Vrms
Operate Time	2msec
Release Time	1msec
Lifetime, Resistive Load	
Mechanical	10^8 Operations
1A, 30VDC	2×10^5 Operations
0.5A, 125VAC	10^5 Operations
Contact Resistance	50 milliohm max.
DC Isolation - Ohms	10^9

Two 20 Pin Headers

20 Pin Header

SPECIFICATIONS

Power	+5 Volts	less than 1.2 Amp
	+12 Volts	25 mA per energ. relay
Bandpass		DC to 50 MHz (-3dB)
Insertion Loss		less than 0.2dB at 10 MHz
Isolation/Crosstalk		less than -50dB at 10 MHz
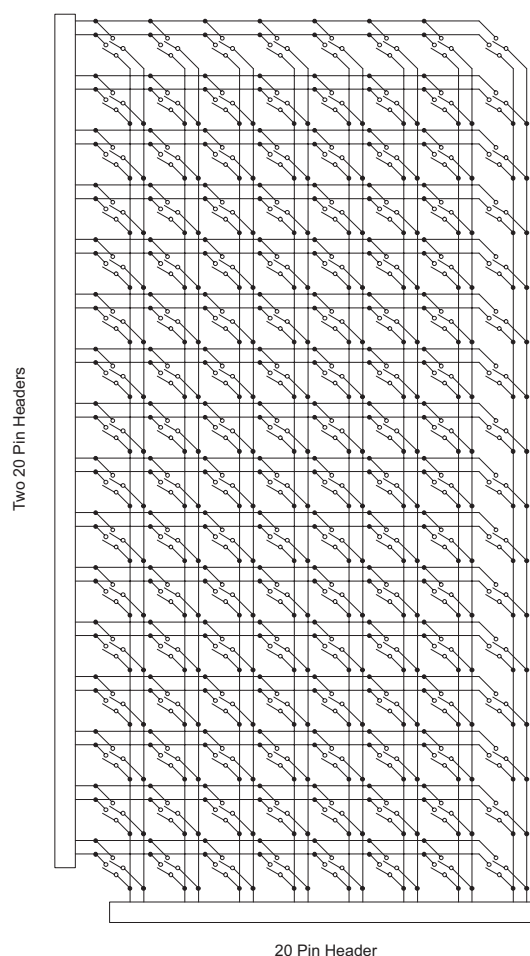
WARRANTY

CYTEC Corp. warrants that all products are free from defects in workmanship and materials for a period of 5 years.

Member of the VXI Plug and Play Alliance..

FOR TECHNICAL ASSISTANCE CONTACT 1-800-346-3117 or WWW.CYTEC-ATE.COM

CYTEC CORP.

CY/G AND CY/M C-SIZE VXI MICROWAVE SWITCH MODULES

The CY/G and CY/M Series of Microwave Switch Modules have user defined configurations and are used to switch RF Signals. Bandpasses of approximately 1.0, 18 and 26 GHz can be provided, and characteristic impedances of either 50 or 75 ohms are available.

MICROWAVE SWITCH MODULES

These Modules are one or two slot wide C-Size VXI Switch Modules which are built in accordance with the end users needs. Two basic series are available: The **CY/G Switch Modules** that furnish a bandpass of about 1 GHz, and the **CY/M Switch Modules** that typically have a bandpass of 18 GHz, with 26 GHz optionally available.

CY/G 1 GHZ VXI SWITCH MODULES

The **CY/G** VXI Switch Modules are assembled using the CXR/2x1-1G, CXR/4x1-1G, CXR/8x1-1G, and CXR/4x2-1G Gigahertz Switch Cards. These cards provide a bandpass of approximately DC to 1 Gigahertz. Multiple cards can be placed in one VXI module, with the number of cards typically limited only by the available VXI panel area.

CY/M 18 OR 26 GHZ VXI SWITCH MODULES

The **CY/M** VXI Switch Modules are used for switching microwave signals. These are one or two slots wide and are built with either the CXM/2x1 A/B Switches or the CXM/Nx1 Rotary Microwave Switches. A bandpass of DC to 18 GHz is standard, with DC to 26 GHz optionally available. As an example, six CXM/6x1 Switches can be fitted into a single two-slot VXI Switch Module.

AVAILABLE MODELS
• **CY/G** One Gigahertz VXI Switch Modules
• **CY/M** Microwave VXI Switch Modules

CONNECTORS
• **SMA recommended because of limited panel space.**
• **Consult factory for other options.**

PRICING:
**These Modules are designed so that they can be assembled using a selection of Microwave relays to meet the customer's specification.
Call our Technical Sales for pricing of your specific requirement.**

0 1 2 3 COM 4 5 6 7
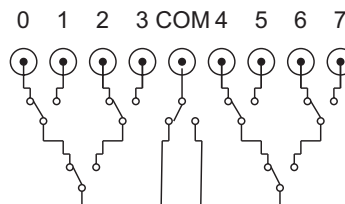
CXR/8x1-1G - Typical of a GHz Switch used in CY/G VXI Switch Modules.

SPECIFICATIONS
Power
+5 Volts, 2.1 A Max.
+12 Volts, 0.2A Max.

Relay Drive Power
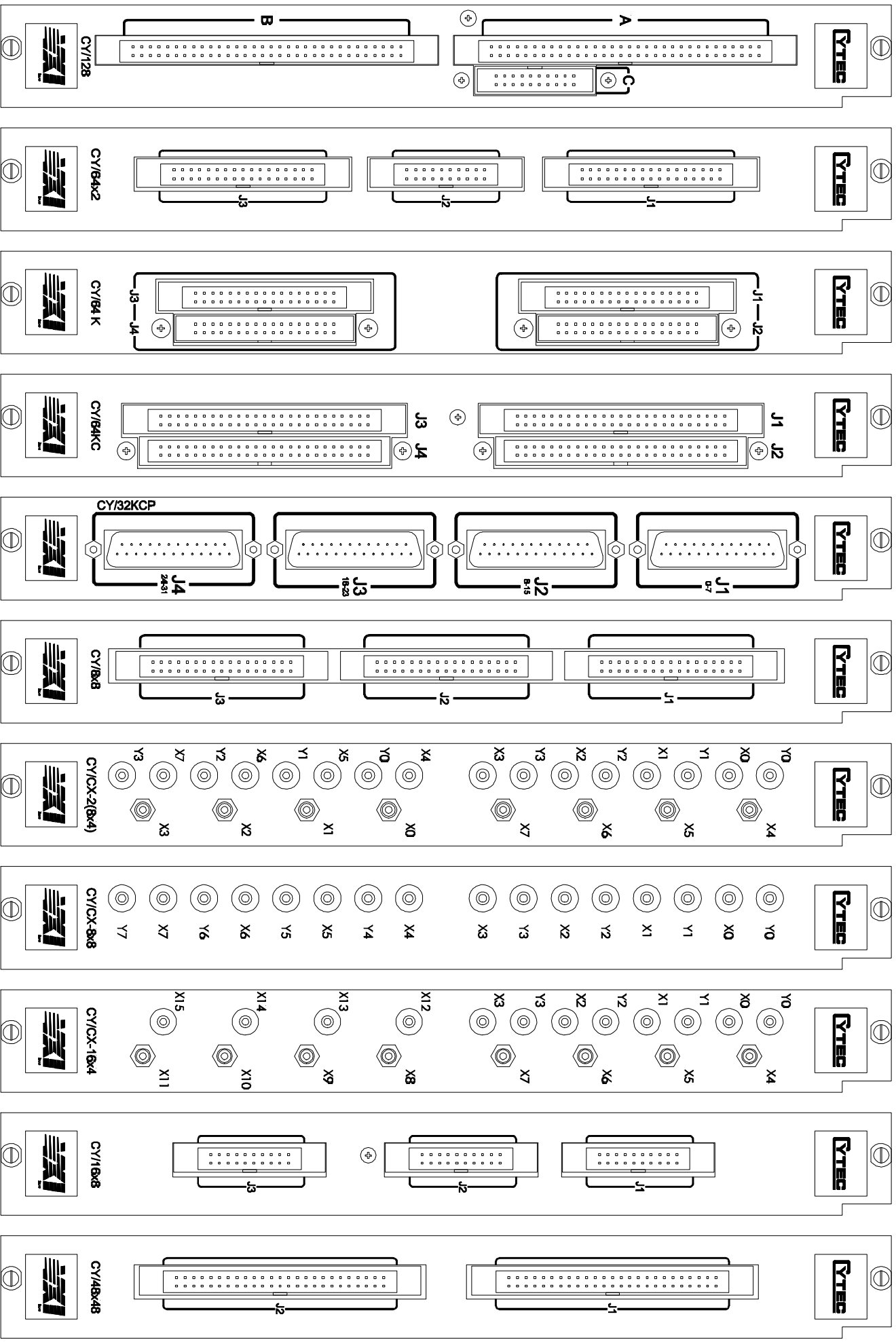Dependent on type of Microwave relays required.
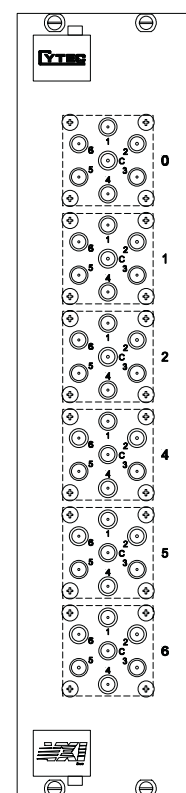
Six CXM/6x1 Relay Module

WARRANTY

CYTEC Corp. warrants that all products are free from defects in workmanship and materials for a period of 5 years. Microwave relays are warrantied for one year.

Member of the VXI Plug and Play Alliance.

FOR TECHNICAL ASSISTANCE CONTACT 1-800-346-3117 or WWW.CYTEC-ATEC.OM

For additional details contact Cytec technical sales at 1-800-346-3117 or www.cytec-ate.com or sales@cytec-ate.com

CY/128

B A C

CY/64x2

J3 J2 J1

CY/64 K

J3 — J4 J1 — J2

CY/64KC

J3 J4 J1 J2

CY/32KCP

J4 24-31 J3 16-23 J2 8-15 J1 0-7

CY/8x8

J3 J2 J1

CY/CX-2(8x4)

Y3 X7 Y2 X6 Y1 X5 Y0 X4 X3 Y3 X2 Y2 X1 Y1 X0 Y0
X3 X2 X1 X0 X7 X6 X5 X4

CY/CX-8x8

Y7 X7 Y6 X6 Y5 X5 Y4 X4 X3 Y3 X2 Y2 X1 Y1 X0 Y0

CY/CX-16x4

X15 X14 X13 X12 X3 Y3 X2 Y2 X1 Y1 X0 Y0
X11 X10 X9 X8 X7 X6 X5 X4

CY/16x8

J3 J2 J1

CY/4Bx48

J2 J1

IEEE488/RS232, AND LAN
INTERFACE MODULES

The following Control Modules are available:
IEEE488/RS232 CONTROL MODULE is a combined Control Module with all the features of the IEEE488 GPIB Bus and the RS232 Serial Module.
LAN unit transfers 10Base-T LAN data to the RS232 Module.

IEEE488/RS232 COMBINED CONTROLMODULE

IEEE488 GPIB FEATURES
This module has the following device subsets.

SH1 - Source Handshake   L4 - Listen Functions   SR1 - Service Request
AH1 - Acceptor Handshake   T6 - Talker Functions

Talk and Listen addresses are the same and set by a 5 position Dip Switch.
Service request operation is programmable and can be used to indicate switch status or command completion.
In the Listen Mode the Matrix responds to all the Commands after the My Listen Address (MLA) has been received. The command string must be terminated by either a (CR), (LF) or (END) character.
The Talk Mode is used to return the Status of the Matrix. This is effected by either the My Talk Address (MTA) or the Serial Poll Enable (SPE).
The basic command strings consist of one or more ASCII characters separated by either a space or comma and terminated by an end message.

Typical Commands Are:
L - Latch -   A specified Module and Switch in a Matrix.
U - Unlatch -   A specified Module and Switch in a Matrix.
X - Multiplex -   Latches a specified Switch and Clears all others.
C - Clear -   Unlatches every switch in the Matrix.
S - Status -   The Status of the selected Switches are returned to the Controller.
F - Front Panel -   Allows enabling & disabling of front panel controls.
T - Test -   Performs a diagnostic test by sequencing through all the switch points at a predetermined rate.
P - Program -   Allows the operator to set up Matrix variables such as size and configuration and stores them in nonvolatile memory.

MANUAL CONTROL OPTION
A Front Panel Manual Control Option allows the Matrix to be controlled from front panel switches. These controls can be "locked out" by the IEEE488 or RS232 Interface to prevent their use.

A Virtual Manual Control Software enables operators to control the matrix using a Graphical User Interface.

RS232 SERIAL FEATURES

The module can be configured as either a Data Terminal Equipment (DTE) or Data Communications Equipment (DCE) and the Baud Rate is software programmable from 110 to 19,200 Baud, stored in non-volatile memory.

This module has the same command structure as the IEEE488 Talk/Listen and has these additional features:

E - Echo - Echos all received characters back to the source.
A - Answerback - Enables the transmission back to the computer of a single character followed by an EOL upon completion of a Command string.
V - Verbose - Enables the matrix to return text strings in response to Commands, including error statements.
H - Help - This is a summary of all the Commands and is only accessible in the Verbose mode.
P - Program - Gives test prompts in setting up the Matrix variables.

MATRIX COMMAND SUMMARY

BASIC COMMANDS

COMMAND	FUNCTION	COMMENTS
L n1,n2	Latch	n1=Module,n2=Switch
U n1,n2	Unlatch	
X n1,n2	Multiplex	
C	Clear Matrix	
S	Matrix Status	
n1,n2	Relay Status	
F n1,n2	Front Panel	n1=0 disable,1enable n2=access
T n1,n2	Diagnostic test	n1=delay, n2=access
P n1,n2, n3	Program setup	n1=Parameter, n2=value, n3=access

RS232 SPECIFIC COMMANDS

COMMAND	FUNCTION	COMMENTS
B n1,n2	Baud Rate	n1=rate, n2=access
A n1,n2	Answerback	n1=0off, 1 on, n2=access
E n1,n2	Echo	n1=0 off, 1 on, n2=access
V n1,n2	Verbose	n1=0 off, 1 on, n2=access
P n1,n2	Program setup	n1=0, n2=access
H	Help	

LAN/RS232 INTERFACE

This unit interfaced between a 10Base-T Local Area Network and the RS232 Control Module giving control of the Switching System from any LAN user at baud rates up to 115.2K. Data Transfer is by TCP/IP and the interface is fully configurable via the RS232 port or from the LAN to a preset IP address.

The input connector is RJ45 and the output connector mates withe the RS232 Control Module.

The Commands Structure is that of the RS232 Control Module.